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Journal of Educational Research

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JOURNAL OF EDUCATIONAL RESEARCH

This journal was established to support educational research workers in all phases of the great problems of teaching. Started in 1920 under the editorship of Dr. B. R. Buckingham and associates among the members of an association of directors of educational research, and accepted as the official organ of the Educational Research Association, its purpose has at no time been confined to a narrow line of specialized research but has been concerned also with professional applications for all workers in education.

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HIGH-SCHOOL SUBJECTS AS CONDITIONERS OF COLLEGE SUCCESS: IMPLICATIONS AND THEORIES CONCERNING MENTAL FACTORS AND FACULTIES

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FROM the time that colleges and universities opened their doors to admit students, major attention has been devoted to their selection. With the increased output of secondary schools, the question of student selection has become numbered among the paramount problems of college administration. During the last decade, the high schools have graduated several times as many students as they have graduated in corresponding periods previous to that time. This increase, coupled with the social and professional demands for increased training, has accentuated the problem of student selection along with other matters of higher education.

When a college or university admits a student, it does so with the expectation that he will not only select one or more of the college majors but will also succeed in them. Course sequences in higher education have beginnings which usually demand definite prerequisites of training except in special cases where unusual capacity seems to serve as well. In addition to meeting the preparatory requirements, the college or university is particularly concerned that the student will carry on successfully to graduation. The term "college risk" with its various qualifiers has become an active element in the vocabularies of university administrators.

The methods used to select college students include specified high-school courses, entrance examinations, merely a high-school diploma, a minimum of high-school scholarship, a specified minimum for high-school graduates on college ability tests, and in some advanced situations by manifested performance on college-ability examinations irrespective and independent of high-school graduation. The last twenty years have witnessed definitely directed statistical attack on the relation of certain entrance qualifications to success in college as measured by quality of grades and by persistence in school. There have been manifold researches which have demonstrated unquestioned relationship between

high-school and college achievement. Applied phases of these studies are evident in colleges which select only the high-school graduates with the highest scholarship. During the past decade with almost a universal sweep mental test data have become administrative aids in student selection.

Even in view of the apparently greater validity of high-school standing and college ability tests for the admission of college students, many schools persist in demanding a minimum number of high-school units in specified subjects. A typical requirement is four years of English, two of mathematics, two of the natural sciences and four of a foreign language. This requirement is made not only to facilitate the coördination of high-school training with college training, but also on the assumption that students having mastered such study, if not better selected, are at least better trained for the mental rigors to be encountered in a college education.

The substance of this study harks back to the vociferously as well as scientifically attacked theory that the study of some subjects trains, equips, or builds up mental vigor which contributes to one's learning ability. In fact the data to be presented lend themselves, with no malicious stretch of the imagination, to such interpretation.

For students who had entered Northwestern University's College of Liberal Arts as freshmen, relationships in tabular form were computed between the numbers of high-school units presented for admission and college scholarship. College scholarship was calculated for the first three semesters of work, the freshmen year and first half of the sophomore year. No definite and unquestionable relationships existed between varied amounts of any high-school subject offered as entrance credentials and honor point average in college except one. That subject is the one which in turn is attacked, glorified, defiled, and haloed. It is Latin.

Before numerical data of this study are presented, reference will be made to a somewhat analagous study by Bolenbaugh and Proctor on academic and vocational pattern groups of subjects presented for college admission and subsequent success in college.[1] The academic-pattern group includes those pupils who included in their fifteen units of high-school work less than three units of vocational work, and the vocational-pattern group those students who included in their high-school study three or more units of vocational work. Bolenbaugh and Proctor concluded that the two groups did about equally well in college.

[1] Bolenbaugh, Lawrence, and Proctor, William Martin. "Relation of the Subjects Taken in High School to Success in College." *Journal of Educational Research*, XV (February, 1927), 87-92.

In view of the criterion of choosing the two patterns which included only 20 percent of the 15 high-school units and in view of the liberality of Stanford in its subject prescriptions, the classification used is a rather loose one. This is further evidenced by the ratio of vocational to academic patterns, which is 4.45 to 1. Additional support for this attitude is found in the correlation between high-school scholarship and Thorndike-Test score which is higher for the vocational group than for the academic. It is rather unusual that abstract intelligence correlates more highly with vocational subjects than with the academic. The authors conclude that there is no relation between subject pattern and college success; but on examination of the tabular material it appears that 7.5 percent more of the academic-pattern group graduated than of the vocational-pattern group. Seven and one-half percent is not very large in terms of modern numerical concepts but is large when considered in relation to college mortality. It assumes added significance when one realizes that in his superlative work on predicting success in college, Johnston can predict scholastic failure in the freshman year without error for 8.4 percent of students entering the University of Minnesota and corresponding success for 3.3 percent.[2] The success differential in favor of the academic-pattern group can hardly be ascribed to the slightly superior intelligence of that group which probably is not statistically significant.

The attitude of the writer concerning the relation of high-school credits to college success has probably been revealed by his taking liberties in the form of a reinterpretation of a study made by two scholars in the field of guidance. In the data which will follow at this time, a substantiation of that attitude is made but no claim is made that dual or multiple interpretations are not possible. One usually has his own hypotheses which are either supported or controverted by the results obtained and on the basis of his interpretations an attitude is formed.

A gross or uncontrolled relationship of the amount of various subjects taken in high school with three semesters of work in Northwestern's College of Liberal Arts is shown in Table I. The most accentuated and clear cut correlation between the amount of a subject taken in high school and scholastic success in college is found in Latin. Here the relationship definitely favors those with the most extensive preparation in Latin, ranging from a "C+" average for those with three or more units

[2] Calculated from data by J. B. Johnston as presented in University of Minnesota Faculty Bulletin, Vol. 1, No. 1. March 1, 1927.

of Latin down through an average of "C—" for pupils with 1 and 2 units of Latin, and then descending to an average about midway between a "D" and a "C" for those who entered the University with Latin missing from their credentials. This relationship is more remarkable when one observes that the number entering without Latin is smaller than the number entering with the designated amounts, thus suggesting that selection favors not the Latin but the non-Latin groups. An interpretative suggestion of rather slight significance is offered in a correlation of –.13 between number of units offered for entrance in all subjects and number of students making the offering. In the matter of French, this relationship is carried to unity. The differences in honor

TABLE I

RELATION OF ENTRANCE UNITS TO COLLEGE SCHOLASTIC RECORD IN TERMS OF POINT AVERAGE

	MATHEMATICS			LATIN			FRENCH			NATURAL SCIENCE			SOCIAL SCIENCE		
	3 or more	2½	2 or less	3 or more	1 and 2	None	3 or more	1 and 2	None	3 or more	2½	2 or less	3 or more	2½	2 or less
Point Average	1.05	1.10	.75	1.26	.78	.55	1.10	.92	.85	.83	.71	.97	.70	1.02	.99
No. of Students	127	110	224	171	180	110	78	163	220	125	27	309	185	77	199
Percentage	28	24	48	37	39	24	17	35	48	27	6	67	40	17	43

points are not as conspicuous as the differences in the number of students offering for admission the classified number of French units.

It is probably pertinent at this point to state that the numerical classification for the various high-school subjects was arrived at arbitrarily as functions of credit distributions made from the entrance transcripts submitted by entering freshmen. The quantitative classifications lend themselves better to Latin and French than to mathematics, natural sciences, and social sciences. For those who desire a new arrangement, inspectional classifications permit comparisons in the three fields mentioned by using 2 units or less and more than 2 units as categories. When that is done, it becomes evident that students entering the University with more than the usually required number of entrance units in mathematics achieve better than those who entered with the bare requisites. To a slight degree the inverse is true for the natural sciences and social sciences.

To hold that these differences and relationships are the result of the training values of these subjects is indefensible. Specific factors which are more important for predicting collegiate scholarship are left uncon-

trolled. Two which are particularly significant in this respect are standings in high-school scholarship and college ability tests (intelligence tests). Research over a period of twenty years has demonstrated the relation of high-school marks to college marks while ten years of statistical study have shown about as high correlation between scores on college ability tests and college scholarship.

It is probable, and it seems to be the common belief, that some high-school subjects are selected by students superior not only in abstract intelligence but in other traits that are reflected by high marks. In terms of central tendencies, those who choose Latin and mathematics are superior in the intelligence of word and symbol to those who select manual arts courses. Probably they are also superior in the character traits which carry one to levels of higher scholarship in fields of abstract learning. That is to be expected, since the factors in the two fields are more similar.

Thus to make a less controvertible comparison of the relation of high-school subjects to college scholarship, intelligence test ability and high-school marks were kept constant. The former factor is equivalent to abstract intelligence while the latter includes intelligence plus traits and habits. Comparisons and relationships were confined to Latin because it was the only subject which showed a direct and marked correlative relationship between the amount of Latin presented for entrance and college scholarship.

Table II shows this relationship according to mental test quarters.[3]

TABLE II

POINT AVERAGE DISTRIBUTION FOR STUDENTS OF THE FOUR MENTAL TEST QUARTERS ACCORDING TO THE AMOUNT OF LATIN WITH WHICH THEY ENTERED COLLEGE

POINT AVERAGE	MENTAL TEST QUARTER	TOTAL		NO UNITS OF LATIN		1 AND 2 UNITS		3 AND 4 UNITS	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
.5 to 3.0	Highest	73	85	10	77	25	76	38	95
.5 to 3.0	Next Highest	66	76	8	47	21	72	37	90
.5 to 3.0	Next Lowest	42	64	9	45	11	58	22	82
.5 to 3.0	Lowest	56	72	12	60	21	72	23	79
-2.0 to .499	Highest	13	15	3	23	8	24	2	5
-2.0 to .499	Next Highest	21	24	9	53	8	27	4	10
-2.0 to .499	Next Lowest	24	36	11	55	8	42	5	18
-2.0 to .499	Lowest	22	28	8	40	8	28	6	21
.5 to 3.0	All	237	75	39	56	78	71	120	88
-2.0 to .499	All	80	25	31	44	32	29	17	12

[3] It should be pointed out here that the test used was the Scott Company Mental Alertness Test which was not designed for college freshmen. The use of this test for measuring incoming freshmen has been terminated. However, for 165 unselected students it correlated .40 with scholarship which is as high as many good tests correlate. Therefore it seems that any classification into quarters on the basis of the Scott Company Alertness Test is probably as valid as on the basis of most tests.

The honor point average used to separate into two groupings is .5, which is half way between a C and a D average. There appear with only one slight exception increasing percentages of students having made marks in the satisfactory range according to increased amounts of Latin. Latin seems to differentiate better than do mental-test quarters. The greatest percentage difference among the mental-test quarters is 21 percent (85-64) found in the percentages of the highest and next to the lowest quarters, while the greatest differences among the Latin categories is 43 percent (90-47) found in the next to the highest mental-test quarter between the groups with 3 and 4 units of Latin and those with none. The bottom half of the table is the inverse of the top half.

In a study of the effect of Latin on college achievement, MacPhail found little difference in freshman performance of college students who presented four years of Latin and those who had studied no Latin in high school.[4] MacPhail paired 54 students on the basis of psychological examinations. The variable was the amount of Latin, and although the Latin group did better the difference was not material.

In Table III are found similar data with corresponding classifications according to high-school scholarship. The relationships are not as

TABLE III

POINT AVERAGE DISTRIBUTION FOR STUDENTS OF THE FOUR QUARTERS IN HIGH-SCHOOL SCHOLARSHIP ACCORDING TO THE AMOUNT OF LATIN WITH WHICH THEY ENTERED COLLEGE

POINT AVERAGE	HIGH SCHOOL QUARTER	TOTAL		NO UNITS OF LATIN		1 AND 2 UNITS		3 AND 4 UNITS	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
.5 to 3.0	Highest	82	95	11	92	17	85	54	100
.5 to 3.0	Next Highest	37	67	2	22	15	71	20	80
.5 to 3.0	Next Lowest	39	67	7	54	14	67	18	75
.5 to 3.0	Lowest	10	67	1	25	5	100	4	67
−2.0 to .499	Highest	4	5	1	8	3	15	0	0
−2.0 to .499	Next Highest	18	33	7	78	6	29	5	20
−2.0 to .499	Next Lowest	19	33	6	46	7	33	6	25
−2.0 to .499	Lowest	5	33	3	75	0	0	2	33
.5 to 3.0	All	168	78	21	55	51	76	96	88
−2.0 to .499	All	46	22	17	45	16	24	13	12

distinct in the case of high-school scholarship as in the case of mental-test ability. That the differences are not marked suggests that the traits and factors that make good Latin students also make good high-school students; but when general combinations are made Latin tends to designate superior students. It is very striking that 54 students, or all of

[4] MacPhail, Andrew H. "Freshman Academic Achievement in College of Students Presenting Four Years of Latin and Those Presenting No Latin." *School and Society*, XIX (March, 1924), 261-262.

those who presented 3 and 4 units of Latin for admission and were in the highest high-school quarter, received grades for the first three semesters of their college course which were above .5 honor-point average.

The numbers selected from the respective quarters indicate a definite selection according to high-school scholarship which does not exist for mental ability. This selection apart from the mental test factor suggests admittance of students by manifested criteria which in themselves characterize a good Latin student as well as a good student in general. Mental ability does not compensate for poor scholarship in high school, for only 48 percent of the students in the lower half in high-school scholarship were in the upper half in mental ability, while 61 percent in the upper half in mental ability were in the upper half in scholarship.

One might with some justice object that intelligence and high-school scholarship are not held constant at the same time and that when one of those two factors is held constant the other is not, and thus one of the two is incidentally included because of the selective nature of Latin. There may be some gravity to such a criticism but it can be answered by numerical comparisons. Table IV contains point averages for those in

TABLE IV

POINT AVERAGES OF STUDENTS IN THE TWO HIGHEST QUARTERS IN BOTH HIGH-SCHOOL SCHOLARSHIP AND MENTAL TEST

QUARTERS		POINT AVERAGES			
		.5 to 3.0		−2 to .0499	
HIGH SCHOOL	MENTAL TEST	No.	Percent	No.	Percent
Two Highest	Two Highest	76	90	8	10

the upper halves in both high-school marks and the college ability test. Ninety percent of those in the best halves of both high-school scholarship and mental test ability maintain scholarship records above the minimum .5 honor-point average; but of those who entered the College of Liberal Arts with 3 and 4 years of high-school Latin and were in the upper half in mental ability, 92.6 percent maintained a scholarship record above that minimum and of those equipped with the same amount of Latin and who were in the upper half in high-school scholarship, 93.7 percent had college scholarship average above .5. Neither of these is much above 90 percent but each, nevertheless, is in favor of Latin.

IMPLICATIONS AND EXPLANATIONS

So far a strong case has been made out for Latin by the presentation and direct interpretation of tabular data. There has been no willful favoritism shown Latin that the numerical results of this study cannot justify. But when one emerges from the phase of interpretation

based on objective data to the interpretative phase dealing with the reasons why Latin constitutes a differential in college success, one immediately enters the realm of controversy and must regard his explanations as both theoretical and hypothetical. The explanations which follow are presented as such.

It may be said that Latin develops a strong, capable mind which manifests itself successfully in academic study. This view has been expressed vigorously as follows: "And though the majority of such boys may never reach the point of being able to read a Latin author with ease and intelligence, they will have been put through a process which in itself may be of real value to their mental development. . . . . There is also the question of the intellectual discipline involved in the exercise of faculties which might otherwise remain dormant."[5]

This author speaks of mental faculties in the plural, which leaves one open to expect greater training of some than of others. If one held for a single mental faculty, then one would expect that the superiority exhibited in college marks by Latin students would be uniform in all subjects. Evidence will be presented later to indicate that such is not the case. However, when one interprets mental functions in terms of faculties, a theory admitting the training of a factor or factors can still be supported, since there may be single or multiple factors, discrete or overlapping and in various combinations, operating in the study of individual college subjects. But then again, the composite result of such hypothetical discussion is that we get nowhere.

One usually explains the superiority of the Latin students as due not to Latin but to the fact that Latin students have greater native ability; that is, their intellectual endowment is greater apart from what Latin may or may not have added. Such an explanation is not considered valid in this study because both intelligence and high-school scholarship were held constant.

But having ruled out the explanation that Latin is selected by the brighter students, one might continue with the same concatenation of thought which has become a stereotype in psychology by maintaining that Latin, when studied sequentially, selects students who are not only industrious and perserving but who possess other volitional traits which make for good scholarship.

The view that Latin develops these traits is best explained in one of

[5] *The Classical Investigation*, Part III, p. 39. Princeton: Princeton University Press, 1925.

the disciplinary objectives of Latin. It is stated as follows: "The development of certain desirable habits and ideals which are subject to spread, such as habits of sustained attention, orderly procedure, overcoming obstacles, perseverance, ideals of achievement, accuracy and thoroughness, and the cultivation of certain general attitudes such as dissatisfaction with failure or with partial success."[5]

No one will question that such qualities can be divorced from scholarship; but the issue is whether persons with those traits survive 3 or 4 years of Latin or whether Latin develops those traits. If one supports the former view he would hold that probably 4 years' study of Chinese or Hebrew would be just as effective as Latin provided that they were as hard or were harder to master. But a close adherence to the selective factor with no room for training is entirely inconsistent with the universal belief that habits can be established and character built. It is hard to conceive that systematically and methodically working out increasingly difficult translation does not develop sustained attention and effective study habits. To deny altogether a training factor is to negate whatever truth there may be in the aphorism, "sow a deed and reap a habit; sow a habit and reap a character."

When high-school quarters were held constant the relation between college scholarship and amount of high-school Latin was not as marked as was true in the case of intelligence test results. It is not unreasonable to maintain that the reduction is due to the phenomenon that when high-school grades are removed as a variable one tends also to hold constant those desirable volitional traits which contribute to school grades and which in turn are said to be a product of Latin study. But those who argue for Latin can with consistency maintain that no argument for selection exists, since the Latin was studied in high school and the high-school marks are in turn the products of the very traits which Latin is said to produce in those who study it.

There is a social phase to be mentioned which is distinctly in favor of those who completed 3 and 4 years of high-school Latin; and that is that those students come from homes where the college ideal exists. It is very probable that a college education is planned by both the student and parents when 4 years of Latin are studied. That such plans operate to condition college success is the testimony of those who deal in student personnel; and more particularly is failure associated with an absence of a plan or intention to attend college. A college ideal in the home

[5] *The Classical Investigation*, Part I, p. 55.

bespeaks a higher social and economic status which again is no insignificant factor in college success. These advantages can hardly account for the markedly superior college record of those who entered with the greatest number of Latin units but must be considered as a contributory factor.

SPECIFICITY OF THE EFFECTS OF LATIN ON THE ACHIEVEMENT IN COLLEGE SUBJECTS

In connection with the evidence that Latin students do make better college students, explanation and discussion have been attempted to provide the reasons for such superiority. Training and selective factors have been mentioned with the intention of emphasizing neither and of discriminating in favor of neither. A previous paragraph contained a quotation which stated that Latin trained the faculties. Comment was made then that if Latin were conceived as training a mental faculty, such as a single mind unit, then ability would manifest itself uniformly in all subjects with no regard for linguistic, mathematical, or manual factors. But if pupils having had 3 and 4 units of high-school Latin show more ability in some types of study than in others, one has evidence that the mental capacities which manifest themselves by success in Latin are multiple, suggesting not a unitary faculty but several. The degree of success would depend on the factors common to Latin and the specific college subjects. On the other hand one might add that training in Latin transfers to the other subjects due to identical elements or to the generalization of abilities and habits developed by Latin.

Table V contains data which offer an answer to the generalness or specificity of the mental training accruing from the study of Latin; or

TABLE V

VARIABILITIES FOR COLLEGE SUBJECTS ACCORDING TO AMOUNTS OF HIGH-SCHOOL LATIN

ENTRANCE UNITS	ALL SUBJECTS	ENGLISH	MATHEMATICS	LATIN	FRENCH	GERMAN	SPANISH	NATURAL SCIENCE	SOCIAL SCIENCE	MISCELLANEOUS
3 or more	.26	.332	.232	.140	.324	.528	.571	.093	.163	.094
1 or 2	−.104	−.131	−.091	−.340	−.281	.176	−.166	.027	−.028	.0285
None	−.282	−.346	−.222		−.342	−.702	−.351	−.154	−.177	−.179

if one takes the viewpoint that Latin operates selectively, it provides an explanation as to the generalness or specificity of the capacities which Latin selects.

The numerical values given in Table V are found by subtracting the honor-point average for each single subject, such as English, mathematics, Latin, etc., from the honor-point averages in these respective subjects earned by the student groups classified in respect to the amount of high-school Latin studied and by dividing the difference of such subtraction by standard deviation for all marks given in each respective subject. By translating the differences in terms of variability units in each subject, direct comparisons of a valid nature can be made.

It becomes apparent that students who have completed 3 or more units of Latin in high school do not manifest uniform ability in all subjects. In general a linguistic capacity or ability manifests itself. The superiority of those taking the greatest amount of Latin is most marked in the languages, with the largest difference being in German and Spanish. In English and French the variations are about equal. In mathematics the differences are substantial but not as marked as in the linguistic subjects. The differences in social sciences favor Latin but not as much as they do in mathematics. The least difference is found in the natural sciences.

These differences do not necessarily argue against Latin as a developer of mental power but they do argue against Latin's training the mind in a unitary fashion or training it as a single faculty. A probable explanation that Latin selected and trained high-school students with linguistic capacities (not capacity) and that there is transfer on the basis of identical linguistic elements and habits of orientation and methods may account for the marked superiority of Latin students in English, French, German, and Spanish. There is apparently a greater overlap of common factors between each of those subjects and Latin. In addition, due to the absence of absolute rigidity in the pursuit of courses, considerable selection was permitted which may account for a strong selective factor's operating in all the languages excepting English. Table VI shows the percentage of work taken in each subject or group of subjects. Thus a selective factor may account for the superior work done in the languages, French, German, and Spanish by those having had 3 and 4 units of Latin. The least selection probably occurred in French which is taken by proportionally more students than is any of the other foreign languages.

The comparatively poorer work done in Latin by those having had 3 and 4 units of high-school Latin connotes that the best students do not continue with Latin. It is probably their practice to consider their

TABLE VI

NUMBER OF STUDENT CREDIT HOURS TAKEN IN THE SEVERAL SUBJECTS WITH PERCENTAGES OF THE TOTAL ACCORDING TO THE AMOUNT OF LATIN COMPLETED IN HIGH SCHOOL

NO. OF OF LATIN UNITS	NO. OF STUDENT CREDIT HOURS AND PERCENT OF TOTAL	ENGLISH	MATHEMATICS	LATIN	FRENCH	GERMAN	SPANISH	NATURAL SCIENCE	SOCIAL SCIENCE	MISCELLANEOUS	TOTAL
3 or more	No. of student credit hours	1239	781	571	993	134	262	1112	757	289	6254
	Percentage of total	19.8	12.5	9.1	15.9	2.1	4.2	17.8	12.1	4.6	100.0
1 or 2	No. of student credit hours	1190	852	236	735	166	405	1309	768	346	6043
	Percentage of total	19.7	14.1	3.9	12.2	2.7	6.7	21.7	12.7	5.7	100.0
None	No. of student credit hours	716	465		337	140	235	910	573	208	3594
	Percentage of total	19.9	12.9		9.4	3.9	6.5	25.3	15.9	5.8	99.9

Latin training adequate and thus transfer their capacities to other subjects. Those who continue in Latin do so in courses satisfied by prerequisites completed in high school. This training is more remote; and, added to the fact that learning (not necessarily a function of teaching) in the high-school years is quantitatively less than in college years, one has at least a hypothetical explanation why the grades achieved in college Latin are relatively lower by those who come to college with the larger number of Latin credits.

If one makes a general interpretation of the success in college subjects by those having had 3 and 4 units of Latin in high school according to factor theories, one might make approximate use of the two-factor theory. It is evident that the students who enter with 3 and 4 credits in Latin average above the general average for all subjects. Such a condition bespeaks a core factor, a single unitary intellective mass, a general fund of intellective energy, or a unified, coördinated group of S-R connections which underlies high-school Latin and college performance to a level shown by the minimum positive deviation exhibited in the natural sciences. Then emerging from above this common factor there appear specific factors most pronounced in the languages and most suggestive therefore that the specific factors are linguistic.

To make another approach at special linguistic factors, Table VII was prepared for French which is similar to Table V for Latin. It may be noted by reference to Table I that French differentiated students as Latin did but not to such a conspicuous degree.

TABLE VII

VARIABILITIES FOR COLLEGE SUBJECTS ACCORDING TO AMOUNTS OF HIGH-SCHOOL FRENCH

ENTRANCE UNITS	ALL SUBJECTS	ENGLISH	MATHEMATICS	LATIN	FRENCH	GERMAN	SPANISH	NATURAL SCIENCE	SOCIAL SCIENCE	MISCELLANEOUS
3 or more	.136	.154	.070	.380	.154	.317	.396	.007	.063	.210
1 or 2	−.001	.041	−.033	−.152	.028	.400	.060	−.018	.021	−.115
No units	−.051	−.086	.015	−.077	−.125	−.118	−.140	.021	−.130	.004

Table VII suggests again that there are special linguistic factors present although selection is operating to accentuate their appearance. The greatest ability appears in the languages. In mathematics, natural sciences, and social sciences, the operation of overlapping factors is at a minimum. This is analogous to the corresponding relationships involving Latin although in the case of Latin, ability in mathematics was more apparent. The correlation of the numerical values given for each college subject for 3 and 4 units of both Latin and 3 and 4 units of French is perfect 1, a most astounding indication that factors are operating consistently in these subjects.[7]

The greater superiority of Latin students in mathematics than in natural or social sciences can hardly be accounted for on the basis of identical elements or overlapping factors. Neither should one expect that the desirable student traits and capacities differentiated by Latin reflect more in mathematics than in natural sciences. If anything, due to subject terminology, the advantage for Latin students should be in biology, botany, physics, and chemistry.

In an attempt to seek an explanation for this apparent discrepancy, mathematics was dealt with in a manner similar to the categorical treatment given Latin in Table V except that two groupings were made, one for students having had two or less units of mathematics, the other for those having had 2½ or more units. The failure of mathematics beyond 2½ units to differentiate pupils according to college success prompted such categorization.

In Table VIII one finds the relative abilities expressed in comparable standard deviation units in quantitative relationships to the

[7] Latin and French were omitted to eliminate the effect of invalidating selective functions. Greek was omitted because of scanty numbers and Miscellaneous was omitted because invalidity is suggested by its general failure to correlate with any of the other measures.

TABLE VIII

VARIABILITIES FOR COLLEGE SUBJECTS ACCORDING TO AMOUNTS OF HIGH-SCHOOL MATHEMATICS

ENTRANCE UNITS	ALL SUBJECTS	ENGLISH	MATHEMATICS	LATIN	FRENCH	GERMAN	SPANISH	NATURAL SCIENCE	SOCIAL SCIENCE	MISCELLANEOUS
2½ or more	.116	.12	.148	.08	.118	.081	−.064	.167	.171	.065
2 or less	−.132	−.128	−.132	−.127	−.141	−.125	.072	−.185	−.117	.083

mathematics taken in high school. An examination of the top horizontal column discloses that additional mathematics does not differentiate as well as 3 or more units of Latin. For all subjects, a deviation of .116 in mathematics may be compared to .260 for Latin. There is a slight suggestion that those who select additional mathematics possess mathematical faculties which are different from linguistic factors. Better work is done in mathematics, natural sciences, and social sciences by those having more mathematics but the differences are not marked.

It may be recalled that although those having had three or more units of Latin manifested special linguistic abilities, they were also quite proficient in mathematics. Thus the Latin mind was capable in mathematics; and in order to answer whether or not the mathematical mind is also a Latin mind, Table VIII was prepared. It appears that the mathematical mind is not specifically a Latin mind nor a language mind in general. The mathematical mind is correspondingly more proficient in its own field and in natural and social sciences, in which two fields the Latin abilities were relatively poorest, although slightly better than the average.

When a correlation is made between the variability units in the college subjects obtained by those having had 2½ or more units of mathematics with those having had 3 or more units of Latin, a correlation of $-.82 \pm .13$ occurs.[8] When variability units for those having taken 3 or more units of high-school French are correlated with the variabilities of those having entered the University with 2½ more units of mathematics is correlated, a coefficient of $-.93 \pm .05$ is obtained.[9]

The obtained relationships, as well as the relative sizes of the variabilities apparent for each college subject as functions of entrance units.

[8] Latin, Mathematics, Greek, and Miscellaneous subjects were omitted.

[9] French, Mathematics, Greek, and Miscellaneous were omitted.

point definitely to multiple mental faculties or factors operating to condition success in college work.

When approaching the explanatory phase of these data, both training and selection must be reckoned with. Even when intelligence and high-school scholarship are held constant, there is still room to argue that Latin selects persons who have the character traits that mark good students rather than being a developer of those traits in the students who elected Latin. However, here it seems that selection alone is not adequate to account for the superiority of Latin students. When one considers the comparable variability units for the individual subjects one becomes impressed again that both selection and training make their contribution. On the basis of generalized training and identical elements one would expect Latin students to do better in the languages. They do; but the selective nature of the language becomes apparent when one relates the number of credits taken in the various languages to the size of its variability units. In English the number is 3145; French, 2065; German, 440; and Spanish, 902.[10] The variability of English and French is about the same as is that of German and Spanish which is markedly higher than that of French and English. These relationships point to the selective nature of some subjects which are not taken by all students. But when the variability units in English are compared to those of natural sciences (in which about the same number of credits are taken) and similarly for French and the social sciences, one observes differences that cannot be accounted for by the selective nature of the subject, but must be accounted for by linguistic training or by overlapping linguistic factors determined by hereditary forces. Beyond a certain point which is very little above the average, a minimum determined in natural science (Table V), there is no room for a general-training theory. Below that point there may be, but the writer is inclined to explain the manifested ability below that point largely on the basis of general mental capacity which can hardly be attributed to any single schooling factor.

EDUCATIONAL IMPLICATIONS AND DEDUCTIONS

A concomitant arising from these data and discoveries is one which questions the advisability of Latin study by high-school students. In answering such a question one must know what Latin does to those who

[10] Latin was omitted for the reason given previously and Greek was omitted because it was taken by too few students.

study it. If Latin does improve one's speech and comprehension, if it instills ideals that are considered desirable, if it builds a character strong in habits of good scholarship, one can recommend it as a subject of intrinsic worth. On the basis of this study not a single one of those effects can be unequivocably ascribed to Latin. There is probably an inference that Latin selects and develops linguistic abilities. It is generally agreed that direct experimental attack has shown that Latin does better one's ability to comprehend word meanings; but as original linguistic abilities were not held constant in this experiment, one cannot ascribe a developmental effect to Latin without carrying selection, along with training, as another explanatory factor. The same explanation may pertain to good scholarship. *Only one thing can be definitely said about the completion of three or four years of Latin. It marks a student as a good student.* If Latin only locates but does not train or modify, then its service is limited to pointing out or selecting good students. This is an expensive process. One probably can select capable students equally well by administering to them a short exercise of an hour's length and subjecting their high-school records to simple statistics. But to make such a disposal of Latin seems a willful oversight of training and experience factors.

Recent research has permitted a new interpretation of school subjects in terms of the utilitarian *versus* the disciplinary and cultural viewpoint. Consistent with a materialistic and commercial age, subject matter has come to be selected because of its palpable usefulness. The criteria of precedence and tradition have had to take heed in the form of a defensive. But now one may offer a valid justification for subjects of less apparent utilitarian value from implications arising from contemporary research. In Part II of the Twenty-Seventh Yearbook of the National Society for the Study of Education there is a battery of evidence for the theory that learning is largely a function of individual capacity and that the many environmental controls which have been set up are dependent for their results on the capacities of those whom they intend to influence. This suggests that if the factors of capacity and maturation are utilized instructionally to their fullest extent, much less time may be devoted to the fundamental learnings that are considered necessary. This is particularly true for the brighter pupils. The time which remains, after that core of materials indispensable in terms of utility has been mastered, can be devoted to making school a good place

in which to live and an opportunity for participation in worthwhile experiences.

Terman states it as follows: "I shall not be surprised if we are in time compelled to modify our educational ideals in several respects. In the first place, I think we shall ultimately come to place more emphasis than we now do upon the ethical and social ends of education, and care more than we now do about making the school a wholesome place to live. In the second place, I think that we shall in future stress more than we now do the training of the child in attitudes and interests, as contrasted with the imparting of subject mastery."[11] Now, if Latin may be considered as a worthwhile experience it has a definite place in the school.

One may question the expediency of an indirect and propaedeutic approach to the languages and sciences via Latin and suggest as more fruitful the direct approach. That may be true in terms of subject matter acquisition; but when one considers the deciduous nature of the memory, one may again minimize the significance of temporarily acquired facts. The fugacity of learned materials directs one's outlook toward other values probably far greater than the utilitarian. The feelings and attitudes developed by courses of study are motive forces far less ephemeral than directly acquired facts and information. If Latin builds in one volitional traits that make for good scholarship and exudes the concomitants of learning and culture, it has a definite place in the curriculum.

One cannot say with unimpeachable certainty that Latin does these things. There is a strong suggestion that it does; but speaking positively in a negative way, one can say on the basis of this study at least that the evidence prevents one from saying that Latin does not make one a good student. Latin students were consistently superior even when two major variables that account for college success were controlled. Although one cannot say that Latin is responsible, neither can he say that it is not. Inferential evidence is for Latin, not against it; and on that basis its rejection in favor of other subjects of unknown validity is hardly sound.

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[11] Terman, L. M. "The Influence of Nature and Nurture Upon Intelligence Scores. An Evaluation of the Evidence in Part I of the 1928 Yearbook of the National Society for the Study of Education." *Journal of Educational Psychology*, XIX (September, 1928), p. 373.

CONCLUSIONS

1. There is an apparent relationship between the amount of various subjects studied in high-school and college scholarship.

2. Latin differentiates according to college success more markedly than does any other subject. French and mathematics do so to a less degree.

3. When general intelligence and high-school scholarship are controlled, Latin still constitutes a differentiating factor.

4. There is a suggestion that Latin develops students into good students.

5. There probably is no evidence that Latin trains a common mental factor or capacity.

6. Linguistic factor or factors as well as mathematical ones seem to exist.

7. The existence of these factors may be due to both training and selection.

8. Success in Latin marks a student as being a good one. If the study of Latin is considered a worthwhile experience, capable students should engage in it.

A PRACTICABLE TECHNIQUE FOR DETERMINING THE RELATIVE EFFECTIVENESS OF DIFFERENT METHODS OF TEACHING

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THE usual procedure in comparing the effectiveness of two methods of teaching is to set up control and experimental groups of as nearly equal ability as possible. In order to secure such groups, more or less involved pairing procedures are often employed. In the usual school situation the pairing process is difficult of accomplishment. Moreover it results in the creation of situations that are far from typical.

Rockwell has devised a technique which would seem to be applicable to educational experimentation[1]. His plan is to employ not one control and one experimental group but several. The strategy of the plan can best be described with a concrete case. For the sake of economy of space the situation utilized in the present study will be used as an illustration. The primary purpose of this article is to describe one attempt to employ Rockwell's technique in educational research.

It was desired to compare the effectiveness of the drill and project methods on one criterion only, that of facts learned. The experiment was carried out in the John Marshall Junior-Senior High School in Minneapolis.[2] To have created special groups for the experiment would have disrupted the school organization. It was therefore necessary to utilize the groups as they existed. There were in the school four regularly organized sections in 7A grade. While the grouping plan followed considered both mental ability as measured by intelligence tests and teachers' judgments concerning pupil abilities, administrative difficulties precluded a complete operation of the scheme. Thus, while the sections vary in median intelligence quotients and median mental ages, there is considerable overlapping from group to group. Table I compares the distributions of mental ages and Table II shows the distributions of in-

[1] John G. Rockwell. Unpublished data on thyroid deficiency. University of Minnesota.

[2] The writers are much indebted to Professor John G. Rockwell, Professor L. J. Brueckner, and Professor Earl Hudelson of the College of Education of the University of Minnesota for helpful suggestions throughout the study. The coöperation of Mr. Ross N. Young, Principal of John Marshall High School, is also appreciated.

telligence quotients for the same sections. Both tables show results as measured by the Otis Self-Administering Mental Ability Test.

In Table III the medians only are given. It will be seen that groups 3 and 4 are equivalent in median mental age, while groups 2 and 3 are equal in median intelligence quotients. It was reasoned that in case section 3 were chosen as the experimental group its achievements could be compared with those of the three other sections. For example, should group 3 (taught by the experimental method) achieve more than group 2, in spite of the handicap of a lower median mental age, such a result would speak well for the experimental method. Should group 3 excel even group 1, the evidence for the experimental method would be even stronger. On the other hand, in case section 3 fell below section 4, even

TABLE I

DISTRIBUTION OF FOUR SEVENTH-GRADE GROUPS OF PUPILS IN GEOGRAPHY ACCORDING TO SCORES ON OTIS SELF-ADMINISTERING MENTAL ABILITY TEST

SCORE	GROUP AND FREQUENCY				
	7a1	7a2	7a3	7a4	Total
70 to 75	1	1			2
65 to 70	8	5	1	1	15
60 to 65	5	8	2	4	19
55 to 60	3	5	7	4	19
50 to 55	5	6	3	6	20
45 to 50		8	4	5	17
40 to 45		3	4	2	9
35 to 40			1	4	5
30 to 35			2	2	4
25 to 30		1	1		2
Totals	22	37	25	28	112
Medians	63	55.5	50.8	50.8	54.75
M.A. Equivalents	16–3	14–9	13–11	13–11	14–8

TABLE II

DISTRIBUTION OF PUPILS IN FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY ACCORDING TO INTELLIGENCE QUOTIENTS (OTIS TEST)

I.Q.	GROUP AND FREQUENCY				
	7a1	7a2	7a3	7a4	Total
135 to 140	1				1
130 to 135		1			1
125 to 130	5	2	1		8
120 to 125	5	7	2	1	15
115 to 120	4	5	5	2	16
110 to 115	5	4	5	7	21
105 to 110	2	6	5	6	19
100 to 105		4	1	4	9
95 to 100		7	2	2	11
90 to 95			1	2	3
85 to 90			1	3	4
80 to 85			1		1
75 to 80		1		1	2
70 to 75			1		1
Totals	22	37	25	28	112
edians	120	110.6	110.5	106.6	111.6

though section 4 has a lower median IQ, it would indicate the superiority of the control method. In the same way, whatever the result of the experiment, various comparisons could be made giving the methods used, handicaps or advantages as the case may be.

In addition to mental test scores it was planned to secure a further measure of the ability of the four sections by a record of their performance on a variety of tasks. For this reason several preliminary experiments were carried on. The purpose of these experiments was to answer the question: Do these four sections always achieve in the same order as their mental test score medians? If minor variations in teaching procedure could be introduced without changing materially the order of performance of the four groups, and in the event that a later modification of teaching procedure did change this order of performance, this fact would seem to increase the significance of the findings. For example, the curve of the pre-test medians in Figure I follows closely the median intelligence test findings in Table III. The same can be said for the data in Tables IV, V, and VI. However, the curve for the final test shown in Figure I breaks definitely with that for the pre-test and with those for mental tests and preliminary experiments. The order of performance for the group has been changed.

TABLE III

MEDIAN MENTAL AGES AND INTELLIGENCE QUOTIENTS OF FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY (OTIS TEST)

ITEM	GROUP			
	7A1	7A2	7A3	7A4
Mental Ages	16–3	14–9	13–11	13–11
Intelligence Quotients	120	110.6	110.5	106.6

PRELIMINARY EXPERIMENTS

Oral and written tests are frequently given in the school. They are made up of questions of an objective nature given at the beginning of the class hour. Table IV gives the median percent of questions answered correctly by the four groups.

TABLE IV

MEDIAN PERCENT OF QUESTIONS ANSWERED CORRECTLY BY FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY

ITEM	GROUP AND PERCENT			
	7A1	7A2	7A3	7A4
Oral Questions	85	81	81	79
Written Questions	84	79	73	69

Check tests were now given for three successive ten-day periods on the previous day's study. The scores were kept by the pupils on graph

sheets which provided space for recording marks for a ten-day period. The median scores are therefore given here for three successive ten-day periods and also in averages for the thirty-day period (Table V).

TABLE V

COMPARING MEDIAN PERCENTS OF QUESTIONS ANSWERED CORRECTLY BY FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY FOR THREE TEN-DAY PERIODS

PERIOD	GROUP AND MEDIAN PERCENT			
	$7A_1$	$7A_2$	$7A_3$	$7A_4$
I	91	83	86	83
II	81	71	75	68
III	91	75	82	68
Average	89	79	80	72

Since part of the 7A curriculum in geography is a review of 7B work it was decided to take two review units and approach them by two different methods. The units selected were "Animal Industries" and "Cereal Farming." During the first week "Animal Industries" was reviewed by all four groups. In groups $7A_2$ and $7A_3$ study was preceded by lecture presentation of the material by the teacher. In groups $7A_1$ and $7A_4$ study was introduced by a questioning procedure during which the teacher sought to interest the pupils in the material and find out what the children already knew in the field. All groups were given the same time for study. On the last day of the week a 20-point matching exercise was given as a test. During the second week "Cereal Farming" was studied by all groups with the methods of presentation reversed. The topic was now introduced in groups $7A_1$ and $7A_4$ by lecture and in $7A_2$ and $7A_3$ by questioning. On the last day a 20-point matching exercise was again given as a test. The results are shown in Table VI.

TABLE VI

COMPARING THE ACHIEVEMENTS OF FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY UNDER TWO METHODS OF TEACHING IN TWO UNITS OF WORK

UNIT	GROUPS, METHODS AND SCORES							
	$7A_1$		$7A_2$		$7A_3$		$7A_4$	
Animal Industries	14	Q	12	L	11	L	10	Q
Cereal Farming	18	L	15	Q	15	Q	14	L

Q—Question approach
L—Lecture approach

It will be recalled that groups 2 and 3 are about equal in median IQ. Group 2 has a somewhat higher median mental age. In achievement, as judged by the various measures described above, these two groups seem to be very nearly equal. In mental ability and in achievement groups 2 and 3 excel group 4. In no case was a performance by group 4 shown to equal the performances of the remaining three groups. Likewise, group 1 seems to be superior in ability and achievement to all of the

other three groups. It appeared that on the basis of intelligence ratings and past performance groups 2 and 3 might be expected to show similar achievement. It might also be expected that the achievement of these two groups would be greater than that of group 4 and smaller than that of group 1, conditions being constant.

It was therefore decided to use group 3 as the experimental group with the remaining groups as controls. The purpose of the experiment was to compare the effectiveness of the project method with a traditional drill procedure. Since the terms "project" and "drill method" may be variously interpreted it was proposed to clarify the situation by following in spirit at least an actual description of a lesson. Two lessons included by Brueckner in his "Scales for Rating Teaching Skill" were selected as being descriptive of the procedures to be followed.[3]

The experimental group was taught by a procedure which in spirit and general outline at least conforms closely to method A below and the control groups were taught by a method approximating method B.

METHOD A

"Teacher F began more than a week before the subject of France was reached to bring material about France into the classroom. Pictures of the cities of France were hung on the walls. References to France and illustrations from French began to turn up in other classes. The children found the teacher at work during her spare time before and after school, upon what, in response to questions, she called her travel book, which she was making for her own pleasure as a present to a friend. Finally a group of pupils came and asked if they too might make a travel book for their geography work. The teacher raised her objections, but finally gave permission to the group to try to persuade the rest of the class to adopt the idea, stipulating only that the class must present a workable plan whereby all could cover the required work in the course of study. The next day at class time a committee appointed by the class presented a good plan. The teacher again raised certain objections which were promptly met by the class as soon as they saw the problems. The teacher accepted the revised plan and the class promptly organized itself into committees and went to work. They either bought the material needed themselves or asked the teacher to get it for them. In four weeks time they had covered the whole French geography and

[3] L. J. Brueckner. "Scales for Rating Teacher Skill." *Educational Research Bulletin*, Vol. 30, No. 12, College of Education, University of Minnesota, Feb. 1927.

more besides. They had interested other teachers in their project, so that in literature, art, music and other subjects the influence of their interest was apparent. Every child in the class had a travel book and while some were better than others, there was not one which did not show creditable standards of workmanship. The teacher was kept busy supplying materials, answering questions, helping the children to achieve their plans, but except for an occasional taking of the class discussion to bring some problem of discipline, workmanship, or understanding before the class for their solution, had no direct hand in the control or direction of the class. The work on France closed with an exhibit of the travel books and the visit of two French friends of the teacher, who were traveling through the city. There was no drill, no recitation of things learned, no work in the usual sense, but every child acquired a very thorough and vital knowledge of French life and ways, and valued his travel book highly."

METHOD B

"The teacher was a rigid disciplinarian. Every child was compelled to keep in perfect order, or sit rigidly in the standard position, to pay absolute attention to everything that was said, and to strive to acquire perfection in all his work.

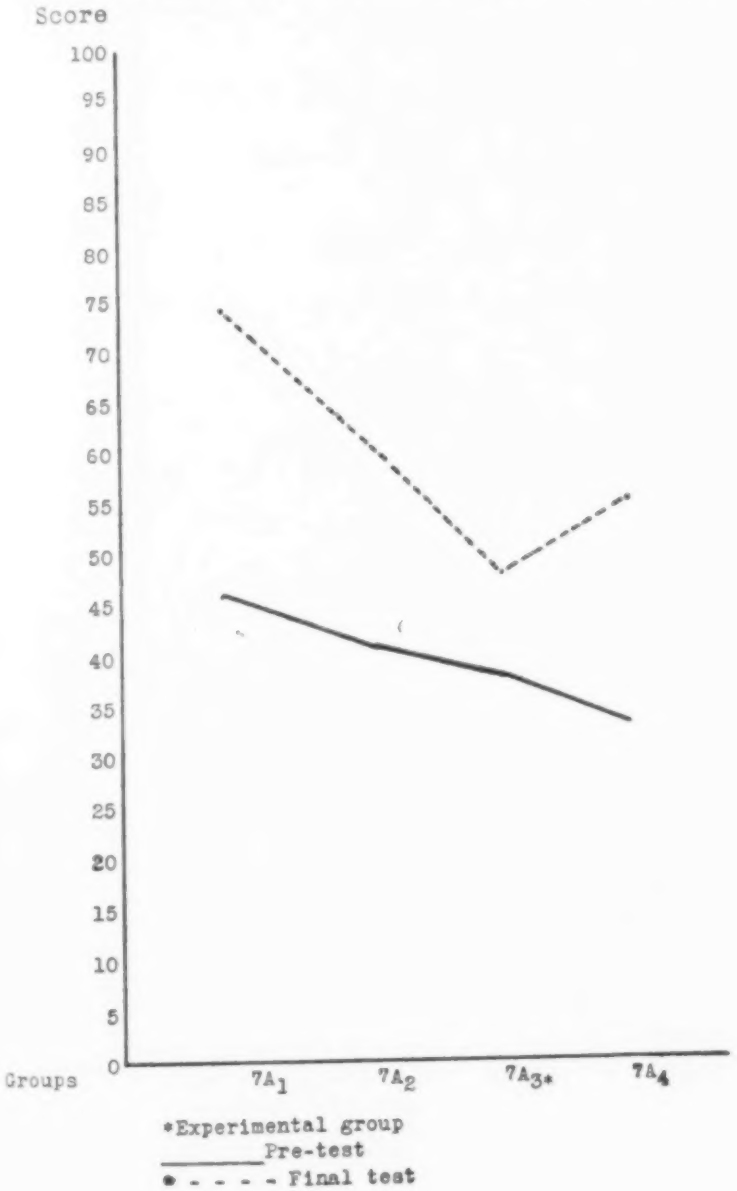
"Every child worked during the period at his top speed, because the lessons assigned were generally sufficiently long to require it and the compelling force back of the command made by the teacher to know these important facts, served to make every one sit up and concentrate on what he was doing. On the other hand if the material was difficult, the lessons were short so that it was possible to learn them.

"Papers were marked with care, every *i* not dotted and every *t* not crossed being noted and later corrected by the pupil. Answers to questions which were not in the exact language of the book were counted wrong, and there were no supplementary readings or discussions. Any child could ask any formal question about anything he did not understand, but the question had to be asked during the study period and not during the recitation.

"The teacher was absolutely fair and impartial, knew every pupil's weakness and success, held herself up to the standards set for the class. Deliberate misbehavior was sure to receive swift and corporal punishment, failure to learn meant additional drill.

FIGURE I

COMPARING MEDIAN SCORES MADE BY FOUR SEVENTH-GRADE GROUPS BEFORE AND AFTER A TWO-WEEKS PERIOD OF INSTRUCTION (Geography of Great Britain)



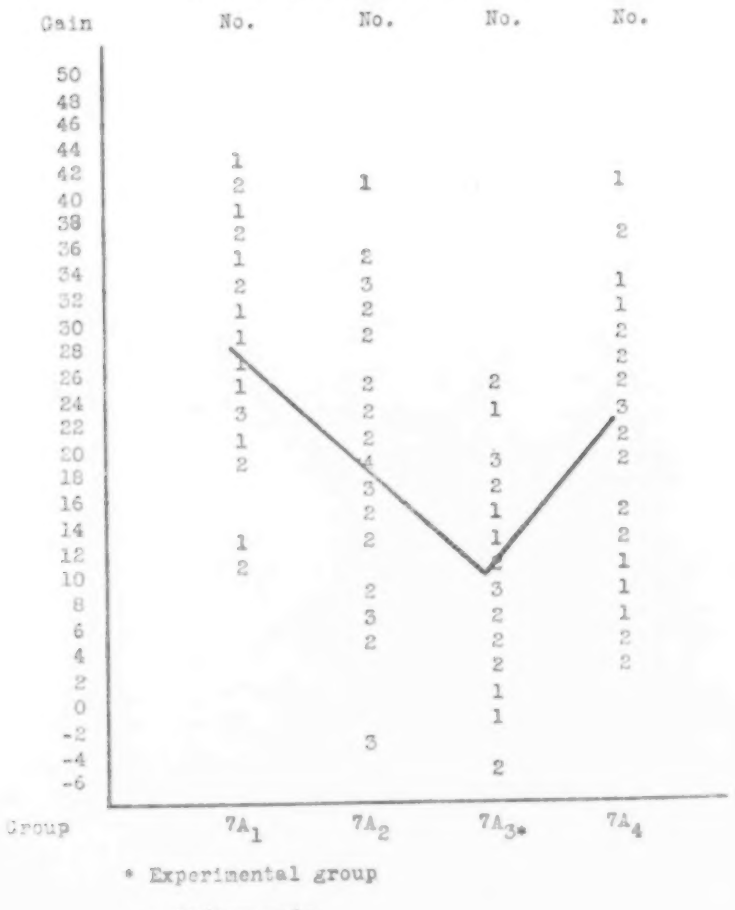
"There was much well-organized drill and review. Class questioning was vigorous and snappy and enjoyed by the entire class. When the study of France was concluded the children could answer any question of the continuous list which the teacher had given, without hesitation, and with no deviation from the words of the text."

THE FINAL EXPERIMENT

The topic studied was a review of the "Geography of Great Britain." An objective test of 100 items was prepared without the teacher's being

FIGURE II

DISTRIBUTION OF PUPILS IN FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY ACCORDING TO GAINS MADE BETWEEN TWO TESTS



informed as to the content. The test was given to the pupils in the absence of the teacher. The papers were kept unscored until after the completion of the unit. This procedure was followed in order that the teacher might not be influenced (particularly in the drill group) by a knowledge of the facts upon which the pupils were to be tested. The work on the unit was continued for two weeks after which the test was repeated. The papers from both tests were now scored by the teacher. The results of the two tests are compared in Figure I and Table VII.

TABLE VII

COMPARING SCORES MADE BY FOUR SEVENTH-GRADE GROUPS IN GEOGRAPHY BEFORE AND AFTER STUDY OF A UNIT ON GEOGRAPHY OF GREAT BRITAIN

TEST	GROUP AND SCORE			
	$7A_1$	$7A_2$	$7A_3$	$7A_4$
I	46 ± 2.14	41 ± 1.62	38 ± 1.6	33 ± 1.43
II	74 ± 1.45	60 ± 1.77	48 ± 1.88	55 ± 1.87

Contrary to what might have been expected from the experimental group in the light of past achievement and in consideration of ability measures, this group fell below all the other groups on the final test. Even group 4, which in mental ability, past achievement, and pre-test scores had been inferior to the experimental group, made a higher median final score and a greater average gain than did the experimental group. Likewise, group 2, which in achievement had usually been about equal to group 3, considerably excelled it in the experimental unit.

The experimental group showed a smaller number of large gains than any of the control groups (Figure II). The gain in median score made by the experimental section was 12 points lower than that of group 4 which had always been excelled by the experimental group in the preliminary studies of ability and achievement. Of the pupils in group 2, 75 percent excelled the median score for group 3. Likewise, 61 percent of the pupils in group 3 fell below the median of group 4 in spite of the fact that the latter group has a lower median IQ and has achieved less in all of the preliminary studies.

IMPLICATIONS

As far as this one experiment is concerned it must be said that a number of factors should be taken into account in passing judgment upon the results. It is possible that in the experimental group the children learned *as many* but different facts from those learned by the control groups; possibly the teaching of the experimental group was at fault; or perhaps the testing instruments were favorable to the control

groups. The pupil, for instance, in the experimental group who was the most efficient committee chairman, who did the best work in organizing her associates for group activities made a very low score on the test and showed very slight gain. She had no opportunity to show such outcomes as growth in capacity for leadership, coöperation, or changes in attitude.

It has probably been surmised that from a philosophical standpoint the writers are sympathetic towards the method followed with the experimental group. The teacher, in fact, was secretly hoping that the results would reflect credit on the experimental method. Normally her teaching approaches this method. She consciously strives for more pupil activity and for a fuller utilization of children's purposes for motivation. It was therefore gratifying to her that throughout the experiment the children in the control groups were conscious of the barrenness of the drill activity and frequently inquired why they could not engage in the interesting activities carried on by group 3. Yet results favored the control groups.

It should out of fairness be kept in mind that attempt was made here to measure only one outcome of instruction; namely, *facts learned*. There may well be other outcomes some of which, at least, transcend facts in importance. If, however, it is considered important that children learn certain facts, such learning becomes at least one legitimate criterion of the success of a teaching method. Should further experiments show comparable results it would appear that the acquisition of the desired facts cannot be left to the chance factors of school experiences, however rich and purposeful such experiences may be in other outcomes. If it is important that certain facts be acquired it would then appear that the learning of those facts must be specifically sought in the teaching procedure.

We do not, of course, know what the results would have been had one of the other groups been selected as the experimental section. This could still be ascertained by using different content. In some situations one might use each method on several groups. This must be done, in fact, in this and other fields and under varying conditions before final conclusions are warranted. A merit of Rockwell's technique is that it easily permits a number and variety of experiments because existing school conditions can be utilized. Evidence of the practicability and flexibility of his technique rather than proof of the relative value of teaching methods is believed by the authors to be the more significant contribution of this report.

THE READING INTERESTS OF ADULTS

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WITH the inauguration of programs of Adult Education there must come simultaneously a systematic study of the needs, interests, and abilities of the participants of these programs. Adults are stimulated to continue their education through the desire to satisfy some specific need, interest, or deficiency, hence, when their respective objectives are not met or are not attainable, withdrawal from the group is the result. Registration, attendance and participation in the adult program is purely voluntary.

The purpose of this study, then, is (1) To discover whether or not the reading material being used in evening school classes for adults meets the interests, needs, and desires of the participants of these classes and groups. (2) To discover what adults read outside of class. (3) To know what proportion of the evening school personnel is a non-reading group. (4) To discover the type of reading interest of adults with respect to subjects. (5) To discover whether or not reading is guided. (6) To find out to what extent the participants of these classes use the Public Library. (7) To develop a method for the cultivation of good reading habits.

In order to analyze adult interests, needs, and activities in reading, a questionnaire was prepared. The form of which was obtained in the following manner: (1) The literature on the subject of reading interests and habits was carefully investigated in order to discover the method employed in similar studies of this problem. (2) A preliminary questionnaire was then developed and submitted to 150 adult students participating in various aspects of the public school adult education program. This preliminary test revealed the necessity of shortening the questionnaire, simplifying and clarifying the questions and preparing a set of instructions for the teacher administering the questionnaire. (3) The third step was consultation with competent experts.

AN ANALYSIS OF THE PERSONAL RECORD CARDS OF 3289 ADULTS

In order to understand the problem under consideration, it is first necessary that we have a clear picture of the characteristics of the student personnel which was investigated. The following tables show the distribution by age groups, sex, and remote ancestry.

TABLE I

DISTRIBUTION OF 3289 ADULTS ACCORDING TO AGE AND SEX

AGE GROUP	MALE	FEMALE	TOTAL	PERCENT OF TOTAL ENROLLMENT
Under 21	312	530	842	25.6
21 to 30	616	439	1055	32.0
31 to 40	331	497	828	25.4
41 to 50	131	291	422	12.8
51 to 60	29	94	123	2.7
60 and over	8	11	19	0.5

TABLE II

DISTRIBUTION OF 3289 ADULTS ACCORDING TO REMOTE ANCESTRY

NATIONALITY	MALE	FEMALE	TOTAL	PERCENT OF TOTAL ENROLLMENT
German	345	185	530	16.1
American (white)	139	338	477	14.5
American (Negro)	155	254	409	12.4
Russian	50	242	292	8.8
Hungarian	119	154	273	8.3
Polish	109	145	254	7.7
Italian	133	35	168	5.1
Jugo-Slav	79	65	144	4.3
Czecho-Slovakian	77	58	135	4.7
Austrian	32	22	54	1.6
Spanish	35	2	37	1.1
Roumanian	11	13	24	.7
24 other groups	274	118	392	11.9

READING INTERESTS OF THE SOCIALLY MALADJUSTED

One of the most important as well as interesting phases of Adult Education is that which is concerned with the socially maladjusted. This field of Adult Education has been influenced largely by the methods and materials of other educational enterprises. It is not surprising, then, that the results of this study should indicate, at least for the institutions investigated, that there is a vast difference in giving young adults what we think that they need, or what we have at hand, and meeting their needs through their interests. No institution or agency is ever justified in artificially stimulating the organization of classes for adults and, likewise we have no right to presuppose that others are interested in the same direction that we are. It is impossible to assume the interests of others and continue a group effectively.

One hundred fifty-three young women were studied in order to discover their reading interests and subsequently to set up a program of reading that would be purposeful and in accordance with the interests of the participants. These young women were confined to six institutions, four for unmarried mothers and two concerned with incorrigibles and temporary detains. While the number of completed questionnaires is too small for generalization, the results are decidedly worthwhile for groups in the institutions concerned.

The following table shows the types of reading that these young women are interested in, the types of magazines and the part of the newspaper read most frequently. Column one represents the response to the question "About what things do you like to read?" Column two represents the response to the question "What magazines do you read?" and column three, as previously stated, "What part of the newspaper do you like to read best?"

TABLE III

DISTRIBUTION OF READING INTERESTS OF 153 YOUNG WOMEN ACCORDING TO SUBJECTS, AND TYPES OF READING

SUBJECT MOST INTERESTING		TYPE OF MAGAZINE READ		PART OF NEWSPAPER READ	
Mystery and adventure	74	Home	95	General News	93
Love Stories	53	Love	38	Comics	56
History and biography	39	Coarse	31	Sports	52
Science-invention	11	Miscellaneous	25	Stories	50
Education	9	General	20	Editorials	44
Health	3	Motion Picture	18	Society	16
Music	2	Religion	3	Advertisements	10
Religion	2	Science	2	Stocks and bonds	0
		Vocational	2		

TABLE IV

MAGAZINES READ MOST FREQUENTLY BY 153 YOUNG WOMEN

Good Housekeeping	38	Literary Digest	14
Ladies Home Journal	21	American	14
True Stories	21	McCall's	11
Saturday Evening Post	16	Pictorial Review	11
Woman's Home Companion	14	Motion Picture	8

Table V indicates the reading interest of this group according to the books which they actually selected for reading. Column one contains the books appearing ten or more times while column two represents the analysis of 187 titles read.

TABLE V

DISTRIBUTION OF 187 TITLES OF BOOKS READ BY 153 YOUNG WOMEN BY FREQUENCY OF READING AND TYPE OF READING

TITLES OF BOOKS READ TEN OR MORE TIMES		AN ANALYSIS OF 187 TITLES OF BOOKS READ BY 153 YOUNG WOMEN	
Old Fashioned Girl	21	Adventure and Mystery	71
Girl of the Limberlost	19	Juvenile	58
Little Women	15	Romance	21
Ben Hur	14	Coarse	19
Robin Hood	14	History-biography	8
Pollyanna	14	Geography-travel	7
Ivanhoe	11	Science-invention	3
Daddy Long Legs	11		
Elsie Dinsmore	10		
Sapphire Light	10		
Dancers in the Dark	10		
Seven Miles to Arden	10		
Mary Cary	10		
Betty Wales Series	10		
Tarzan	10		

THE ADULT IMMIGRANT

More has been accomplished in the field of Adult Immigrant Education than in any other phase of adult education involving elementary instruction. Here too, however, educators have been content to inflict upon the participants of the various groups, material, juvenile both in content and in approach, long since discarded by the day school as material otherwise antiquated and unsuited to adult needs and interests.

Table VI indicates the reading interests of the 1421 adults who responded to the questionnaire.

TABLE VI

SUBJECTS MOST INTERESTING		TYPES OF MAGAZINES MOST FREQUENTLY READ		PART OF NEWSPAPER MOST FREQUENTLY READ	
History and biography	509	Foreign	296	News	721
True Stories	324	General	175	Comics	393
Romance	274	Miscellaneous	174	Stories	346
Travel and geography	205	Romance	91	Editorials	216
Science-invention	169	Scientific	82	Advertisement	193
Adventure-mystery	153	Vocation and trade	74	Sports	186
Philosophy-psychology	147	Labor	69	Society	93
Government and politics	141	Lodge	57	Womens page	15
Vocations	115	Home	48	Stocks	9
Nature	91	Health	17		
Sports	60	Coarse	11		
Foreign Classics	51	Religious	11		
Parental Problems	35				
Religion	24				
Social Problems	21				
Health	19				
Humor	18				
Business	7				
Art-Music	7				
Poetry	6				

TABLE VII

DISTRIBUTION OF MAGAZINES READ MOST FREQUENTLY BY 1421 ADULT IMMIGRANTS

Foreign	299
Saturday Evening Post	85
Liberty	60
Literary Digest	59
True Story	59
American	31
Geographic	30
Ladies Home Journal	28
Woman's Home Companion	25

READING INTERESTS OF MOTHERS' GROUPS

More women are participating in the day classes for adults now than at any other previous period. The tendency seems to be to study and read subjects rather than courses. Women who enrolled in classes to learn English four years ago are now continuing their efforts in the field of American Literature. Others have followed history and biography; others have manifested a continuous interest in geography and travel. Few mothers have expressed a desire for parental educational courses per se. The answer, and it is almost unanimous, is well voiced by one mother who said, "Infant hygiene! Cooking! Say, what do

you suppose we come to school for? All day long we have children to care for. What we want is something to develop new and other interests."

It has been found that by meeting existent interests, other interests may develop and as a result the need of the individual will be met in spite of the apparent opposition of the participant. For example, these mothers were not interested in learning more about their children though many of them were in dire need of assistance in this direction. They wanted to study literature. Their interests were satisfied. Soon the theme turned to children's literature, and then to problems of child training. Thus, needs have been met by satisfying the primary or initial interest of the individual.

The interests of 353 mothers are expressed in Tables VIII and IX following:

TABLE VIII

THE READING INTERESTS OF 353 MOTHERS

SUBJECTS MOST INTERESTING		TYPES OF MAGAZINES MOST FREQUENTLY READ		PART OF NEWSPAPER READ	
History-biography	118	General	121	News	241
Short Stories	95	Home	102	Comics	162
Romance	92	Foreign	93	Stories	99
Home	25	Miscellaneous	83	Advertising	72
Travel-geography	20			Editorial	52
Religion	18			Society	21
Science-invention	16			Financial	0

TABLE IX

DISTRIBUTION OF MAGAZINES READ MOST FREQUENTLY BY 353 MOTHERS

Foreign	58	Woman's Home Companion	15
Saturday Evening Post	39	Other Housekeeping Journals	28
Literary Digest	27	American	11
Nation	25	National Geographic	11
Liberty	24	True Story	10
Ladies Home Journal	18		

OTHER GROUPS

There is another group of adults participating in the adult educational program of the public school that responded to the questionnaire.

TABLE X

THE DISTRIBUTION OF READING INTERESTS OF 228 ADULTS PARTICIPATING IN THE PROGRAM OF ELEMENTARY INSTRUCTION

SUBJECTS MOST INTERESTING		TYPE OF MAGAZINE MOST FREQUENTLY READ		PART OF NEWSPAPER MOST FREQUENTLY READ	
History-biography	93	General	78	General News	130
Religion	75	Home	41	Comics	96
Mystery-adventure	72	Adventure-mystery	37	Editorials	75
Vocations	51	Scientific	18	Sports	52
Travel-geography	29	Coarse	12	Stories	52
Romance	21	Nature	9	Advertising	30
Business	18	Health	8	Society	22
Music	14	Others	43	Financial	2
Philosophy-psychology	10				
Housekeeping	8				

Two hundred twenty-eight native born Americans satisfying the requirements for completion of the elementary studies' curriculum for adults indicated their reading interests as follows:

TABLE XI

MAGAZINES MOST FREQUENTLY READ BY ADULTS PARTICIPATING IN PROGRAM FOR COMPLETION OF THE ELEMENTARY CURRICULUM

True Story	52
American	36
Saturday Evening Post	30
Liberty	28
Ladies Home Journal	21
Cosmopolitan	20
Good Housekeeping	16
Literary Digest	12
Colliers	9
World's Work	3

Tables XII, XIII, XIV, and XV present a picture of the reading interests of the 2127 adults who responded to the questionnaire. It is apparent that interests in reading vary with the group and field of educational endeavor in which the group is found. It is, likewise, evident that if adults are to be interested in reading for pleasure, their interests must be consulted. Reading whether it be the logical pursuance of a systematic reading program, a part of a formalized course of study, a list of books supplementary to a text book, or whatever be the function and place of reading in the educational program, it is essential, in any case, that to be profitable, reading must be made pleasurable.

Reading should never become a task in a group. All individuals do not respond to the same stimuli in the same manner. It is evident, therefore, that if the educational program calls for the satisfaction of the same reading requirements for all, or recommends and advises that the participants of a group read certain material, due recognition must be taken of the variety of forces that combine to produce individual needs, interests, and desires. To compel a group to read in spite of their interests, is to reduce reading to a task, a condition both annoying and dissatisfying to the participant.

Whatever may be the needs of adults with respect to reading, or whatever may be their reading deficiencies, or their reading habits, it becomes increasingly necessary that these problems be met through a study and diagnosis of the reading interests of the participants of the group or number of groups and not through the medium of those responsible for the group or groups.

Table XII lists the various types of reading interests as revealed by 2127 replies to the question "About what things do you like to read?"

TABLE XII

TYPES OF READING INTEREST OF 2127 ADULTS

TYPE OF READING INTEREST	SOCIALLY MALADJUSTED	RANK	ADULT IMMIGRANT	RANK	MOTHERS	RANK	OTHERS	RANK	TOTAL	RANK
History and biography	39	3	509	1	118	1	93	1	759	1
Romance	53	2	274	3	92	2	21	6	440	2
True Stories	0	–	324	2	0	–	0	–	324	3
Adventure-mystery	74	1	153	6	0	–	72	3	299	4
Travel-geography	0	–	205	4	20	4	29	5	254	5
Science-invention	11	4	169	5	16	6	0	–	196	6
Vocations	0	–	115	9	0	–	51	4	166	7
Philosophy-psychology	0	–	147	7	0	–	10	7	157	8
Government-politics	0	–	141	8	0	–	0	–	141	9
Religion	2	6	24	14	18	5	75	2	119	10
Nature	0	–	91	10	0	–	0	–	91	11
Sports	0	–	60	11	0	–	0	–	60	12
Parenthood	0	–	35	13	25	3	0	–	60	13
Foreign Classics	0	–	51	12	0	–	0	–	51	14
Business	0	–	7	18	18	5	0	–	25	15
Art-music	2	6	7	18	0	–	14	6	23	16
Health	3	5	19	16	0	–	0	–	22	17
Social Problems	0	–	21	15	0	–	0	–	21	18
Humor	0	–	18	17	0	–	0	–	18	19
Poetry	0	–	6	18	0	–	0	–	6	20

Tables XIII and XIV show respectively the types of magazines most frequently read by 2127 adults and the magazines most frequently read. It is interesting to note that the majority of the reading here indicates non-vocational interests with respect to magazine reading.

TABLE XIII

TYPES OF MAGAZINES MOST FREQUENTLY READ BY 2127 ADULTS

TYPES	SOCIALLY MALADJUSTED	ADULT IMMIGRANT	MOTHERS	OTHERS	TOTAL
General	20	175	121	78	394
Miscellaneous	25	174	104	52	355
Foreign	0	276	59	0	335
Home	95	48	61	41	245
Mystery-adventure-romance	38	91	0	37	166
Scientific	2	82	0	18	102
Vocation and trade	2	74	0	0	76
Labor	0	69	0	0	69
Coarse	31	11	10	12	64
Lodge	0	57	0	0	57
Health	0	17	0	8	25
Motion Picture	18	0	0	0	18
Religious	3	11	0	0	14

TABLE XIV

MAGAZINES READ MOST FREQUENTLY BY 2127 ADULTS

MAGAZINES	SOCIALLY MALADJUSTED	ADULT IMMIGRANT	MOTHERS	OTHERS	TOTAL
Foreign	0	299	58	0	357
Saturday Evening Post	16	85	39	30	170
True Story	21	59	10	52	153
Literary Digest	14	59	27	12	112
Liberty	0	60	24	28	112
American	14	31	11	36	92
Ladies Home Journal	21	28	18	21	88
Woman's Home Companion	14	25	15	8	62
Good Housekeeping	38	10	12	0	60
Geographic	0	30	11	0	41
Nation	0	0	25	0	25
Cosmopolitan	0	0	0	20	20

When we consider that 324 adult immigrants expressed an interest in reading true stories, by which was meant stories true to life—historical romance, biography, adventures in the new land, human interest stories—it is not at all peculiar, at least to those who know the immigrant, that some of the most spurious reading material may find a wide circulation and happy acclaim from those who would read true stories.

For every type of discussion and study group there are magazines suitable for use therein. Not only would these periodicals meet the dominant interests of the group, but simultaneously there would come the development of the magazine reading habit. Those who are responsible for the reading of a group cannot afford to ignore the mass of periodical literature that may be effectively used in adult groups.

The newspapers furnish another interesting and important index of reading interests. What parts of a newspaper do adults most frequently read? Table XV indicates that general news ranks first, and then follow the comics, stories, editorials, advertisements, sports in order. Little attention is paid to the society column, less to the women's page, and but two out of 2127 adults were at all interested in the financial page.

TABLE XV

PARTS OF THE NEWSPAPER MOST FREQUENTLY READ BY 2127 ADULTS

TYPES	SOCIALLY MALADJUSTED	ADULT IMMIGRANT	MOTHERS	OTHERS	TOTAL
News	93	723	241	120	1177
Comics	56	393	101	96	646
Stories	50	346	99	52	547
Editorials	44	216	52	75	387
Advertisements	10	195	22	30	257
Sports	52	186	0	52	290
Society	10	33	21	22	86
Women's page	0	15	0	0	15
Financial	0	0	0	2	2

Adults in public evening schools are reading few books outside of the regular class or group activity. A total of 528 books were read by 2127 adults over a period of three months. There were 176 different titles read. The Bible ranked first with 135 different readers. It should be mentioned, however, that of these, 109 were Negroes, among whom a greater devotion to the Bible and religious practice exists than possibly in any of the other groups participating in this study.

The dictionary was the next most frequently mentioned book. This would naturally be expected in those groups largely foreign.

"Quo Vadis," "Les Miserables," "La Divina Comedia," "The Peasant," and "Ben Hur" ranked next in order. It was not unexpected that most Poles should have read "Quo Vadis" by the immortal Sienkiewiez and Reymont's "The Peasants."

Italians contribute greatly to the large number reading "La Divina Comedia" and "Les Miserables," although this later seems to have become the most commonly read book for all groups, at least, it is mentioned more frequently than any other. The probable cause for this circumstance is that an adaptation of this book was used in many classes and groups. The books mentioned twenty or more times are tabulated in the following table:

TABLE XVI

BOOKS READ TWENTY OR MORE TIMES BY 2127 ADULTS EXCLUSIVE OF THOSE TABULATED IN TABLE V

Bible	135	Ben Hur	29
Dictionary	92	Life of Lincoln	29
Les Miserables	48	Biography of Benjamin Franklin	24
Quo Vadis	36	Hungry Hearts	22
The Peasant	31	Promised Land	22
La Divina Comedia	30	Life of Josephine	20

The book reading of adults in public evening schools as evidenced by the replies of 2127 different individuals indicates rather clearly that these groups are not book reading groups. Their immediate objective has been satisfied, that is, to learn how to read or to improve themselves in some fundamental skill. How much could be done, however, to meet the interests of the group if an effort were made to use books to satisfy these interests as a part of the group activity, depends mainly upon the ability of the teacher or group leader to select, suggest or recommend books that meet the interest of the participant.

The facts on the reading of books as indicated in this study are practically worthless, except as they indicate the extreme book-reading poverty of these classes which exists unmolested in the midst of a veritable reader's goldmine.

It is granted that adults who labor day in and day out, who sacrifice three evenings per week for self improvement, do not have a large amount of leisure time for reading. It is further granted that many of these people do not read English. In the face of these limitations, however, the contention is made that reading for adults must be purposeful and in support and satisfaction of their interests. It, therefore, becomes a function of the evening schools to provide the reading material which may be used to satisfy these interests. This becomes all the more necessary when groups, such as the present study includes, clearly manifest certain reading interests on the one hand, and likewise, so clearly indicate failure to satisfy those interests on the other hand.

Reading should be considered in the light of the individual rather than the group. There is no more reason why reading should be considered as a group activity than spelling. In other words, teachers and leaders must prepare to become readers' advisors, and in that capacity guide the reading of the participants of their groups, that is to say, they should be able to recommend material within the comprehension of the individual that will meet his needs, interests, and activities.

In this connection, may it be said that until such time as teachers and leaders are properly prepared to give this advice without the nullifying effects of the subjective element, that a more intimate relationship should be entered upon between the Public Library and the group. The teacher or leader must become the liaison agent between the readers' advisor of the library or the librarian staff and the class.

Groups wherein reading is one of the primary objectives should follow a specific course. For example, a class in history can best meet the individual interests of all the group by selecting such books and other reading material for the course as will include mystery, adventure, romance, or such other interests as the group indicates. The person who is interested in adventure gets his history but he finds his adventure too. The person who is primarily interested in romance may find it in science. Thus, almost every interest may be satisfied and the needs of the group served by serving their interests.

For every member of a class to read the same material is an idle waste of time. All adults do not make the same phonetic errors, or the same errors in enunciation and pronunciation. The primary function of oral reading is to perfect these and other related skills. Reading becomes a dull, listless process when a group of twenty adults read and

re-read the same few paragraphs repeatedly. Like visual education, activities or any other important aspect of educational method, reading may become a time consuming element in the whole educational scheme.

Learning to learn how to read is, therefore, a more difficult function than learning how to read. It is this first process that must be kept in mind after the adult is raised from a state of illiteracy.

READING INTERESTS OF HIGH-SCHOOL CHILDREN

VERA ELDER AND HELEN S. CARPENTER
Librarians, Julia Richman High School

MUCH has been written in books and magazines about the reading interests of children of the primary, the elementary and even the junior high school, but there is little material about the reading interests of the senior high-school pupils, perhaps because it is generally accepted that the ideals and interests of the adolescent child are all nicely formed in his juvenile years and that these persist through late adolescence. In an effort to discover what girls of high-school age like to read, a survey was made in the Julia Richman High School by the school librarians.

This school is one of New York's largest schools for girls, having a registration of about 4000. The student body is average for New York City, being made up of all nationalities with a large percentage of Jews. The school offers a four year general course with academic, commercial and fine arts electives. It is divided into four groups based on the results of elementary school records, observation, and intelligence tests. Special emphasis has been placed upon vocational guidance and the course for the group of lowest intelligence has been modified in order to meet their needs.

The survey was made largely in the school library which is used for reference and reading by eight to nine hundred pupils daily and has an average circulation of two hundred books per day. The survey consisted of a questionnaire, a set of cards, a set of compositions on the reading preferences of a second term class, and the pupils' records of books read for outside reading during the four years of high school.

The questionnaire was planned in an endeavor to discover the most popular titles among high-school girls, the kinds of fiction in the order of their preference, the magazines which they read most, and the effect of the physical makeup upon their choice of books. The form used was as follows:

TABLE I

QUESTIONNAIRE

Section Age

1. Name five books which you have read and liked.
2. Arrange the following kinds of fiction in the order of your preference: Stories of Home, Love stories, Mystery stories, Fairy stories, Character stories, School stories.
3. Name three magazines which you enjoy reading.
4. Answer the following questions with *yes* or *no*.
   1. Do you prefer books which have illustrations?
   2. Do you prefer books with bright covers?
   3. Do you dislike large books?
   4. Do you like thin books?

Section and age were asked for but it was especially requested that no name be signed to the questionnaire, since it was believed that in this way there would be less possibility of the pupils making their responses merely to meet the approval of the teacher. In considering the answers to the questions the year in school was made the basis of calculation rather than the age of the pupil. The average age for each year was then taken from the ages given on the questionnaire and was found to be as follows: 14 years in the first year, 15 years in the second year, 16 years in the third and 17 in the last.

The questionnaire was distributed at the beginning of each library period throughout the day. As the pupils have free access to the library during study periods and before and after school, and as the findings of the questionnaire are based on one day's attendance, they may therefore be considered as representative of the school.

Four hundred eighty-seven questionnaires were filled out, divided among the four years of school as follows:

First year	138
Second year	132
Third year	86
Fourth year	131

Owing to the fact that there were fewer third year pupils in the library on this day, fewer questionnaires were filled out by girls of this year and allowance for this had to be made throughout the calculations.

In considering Question 1, all titles chosen four times or more during the four years were selected for the first tabulation. This list consisted of 113 titles with "Sorrell and Son" far in the lead, having a total of 92 votes in the four years. The following table shows the distribution of choice of the 17 most popular books among the four school years:

TABLE II

Name of Book	1st Year	2nd Year	3rd Year	4th Year	Total
Sorrell & Son	14	14	17	47	92
Jane Eyre	20	15	4	8	47
Little Women	31	10	3	2	46
Oliver Twist	15	17	3	2	37
Scarlet Pimpernel	1	16	12	2	31
Tale of Two Cities	3	18	5	1	27
Wings	9	8	1	7	25
Les Miserables	4	6	8	6	24
Silas Marner	2	18	4	0	24
Secret Garden	14	18	0	0	32
Seventeen	9	6	7	0	22
Mill on the Floss	0	13	4	3	20
Scaramouche	1	6	9	2	18
Ivanhoe	11	4	1	2	18
Treasure Island	16	1	1	0	18
Ramona	5	7	2	2	16
Private Life of Helen of Troy	2	3	3	7	15

From this table the following deductions may be made. The old standard books of fiction have not lost their popularity in the high-school age but they are more popular in the lower terms as is shown on the chart by "Jane Eyre" and "Oliver Twist," which have a total vote of 47 and 37 votes respectively. The effect of required reading on the popularity of certain books must be taken into account as in the case of "Silas Marner" in the second year and "Ivanhoe" in the first year, which received a large number of votes in the years in which they are required reading. It is evident also that the new fiction is read more in the higher grades as shown by "Sorrell and Son" and the "Private Life of Helen of Troy" which have 14 and 2 votes respectively in the first year and 47 and 7 in the fourth year. The screen presentation of these books is probably a contributing cause of their popularity. The simple wholesome type of romance and home story such as "Little Women" and "Secret Garden," which are very popular in the first and second years lose their popularity in the third and fourth years. "The Mill on the Floss" which receives not a single vote in the first term, becomes popular in the second year because it appears on the supplementary reading list for that year, but it continues to have a fair amount of popularity in the third and fourth years.

In the second question the pupils were asked to arrange the different types of fiction in the order of their preference. The answers to the question were tabulated and it is interesting to note that when the four years are considered as a unit, mystery stories hold first place, love stories second, character studies third, school stories fourth, home stories fifth, and fairy stories last; but when the tabulation is examined from the standpoint of individual years, a decided change and development of interest is apparent, as shown in the following. Mystery holds first place through the second year, then love stories take first place in the third year and are in turn supplanted by character stories in the fourth year. Mystery stories drop back to the third choice in the fourth year. Love stories, which are the second choice in the first and second years, advance to first choice in the third year and fall back to second place in the fourth year, but they always remain either first or second choice. Character and home stories both increase in popularity in the higher terms, changing from fourth and fifth choices, respectively, in the first year to first and fourth choices in the fourth year. School stories decrease in popularity, changing from third choice in the first year to fifth in the fourth year. Fairy tales remain sixth choice throughout which

probably indicates that fairy tales have already lost their interest by the time the pupil enters high school.

In question 3 the pupils were asked to name three magazines which they enjoyed reading. It was found that many more names of magazines were given in the first and second years than in the third and fourth, varying in number as follows: 63 in the first year, 58 in the second, 43 in the third and 44 in the fourth. The first year pupils listed more cheap and worthless magazine such as "Cupid's Dairy" and "Ghost Stories" and more juvenile magazines such as "Child Life" and "Little Folks." Every magazine chosen at least ten times in any one year was selected and arranged in the following table:

TABLE III

Name of Magazine	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	Total
Saturday Evening Post	35	45	33	50	163
Ladies Home Journal	45	41	17	36	139
Cosmopolitan	19	24	19	32	94
Literary Digest	18	26	12	24	80
Good Housekeeping	21	16	12	24	73
Motion Picture Magazine	25	18	3	10	56
Colliers	9	14	16	10	49
Judge	21	9	7	11	48
Liberty	18	10	8	10	46
Atlantic Monthly	0	4	16	19	39
Woman's Home Companion	7	15	8	8	38
Harper's	4	6	9	18	37
McCall's	15	12	3	5	35
St. Nicholas	15	11	2	5	33
College Humor	6	14	5	5	30
American Magazine	5	7	3	14	29
Scribner's	2	5	8	13	28
American Girl	17	5	4	0	26
Pictorial Review	10	4	3	0	17

The two most overwhelmingly popular magazines were found to be the "Saturday Evening Post" and the "Ladies Home Journal" which had 163 and 139 votes respectively; next in popularity was the "Cosmopolitan" with 94 votes. A glance at Table III will show that the better magazines become increasingly popular in the higher terms as shown by the "Atlantic Monthly," "Harper's," and "Scribner's" which received 0, 4 and 2 votes respectively in the first year and 19, 18 and 13 in the fourth year. Such magazines as "Judge," "Liberty," and the "Motion Picture Magazine" gradually lose their popularity in the upper grades, having 21, 18, and 25 votes, respectively, in the first year and 11, 10, and 10 in the fourth year. The juvenile magazines also, such as "St. Nicholas" and "American Girl," decrease in popularity year by year.

Question 4 asks the pupils to answer four questions in regard to the physical makeup of a book to determine whether this has much or little

to do with their choice of books. From the answers to these questions Table IV was made.

TABLE IV

Question	1st Yr.		2nd Yr.		3rd Yr.		4th Yr.	
	Yes	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
Do you prefer books with illustrations?	126	10	104	30	56	29	80	48
Do you prefer books with bright covers?	64	71	34	95	25	57	55	70
Do you dislike large books?	47	88	55	75	23	61	42	72
Do you like thin books?	57	75	70	57	32	50	44	65

By this table it is shown that more pupils prefer books with illustrations but that the interest in illustrations steadily declines during the four years. It would seem from the answers to part 2 of this question that in none of the four years were the pupils attracted especially by bright covers; but from the comments on some of the papers it appeared that they were suspicious of this question and were perhaps not quite frank.

As high-school librarians have so often had the experience that pupils refuse large books in favor of smaller ones regardless of content, parts 3 and 4 of the question were included. If the answers to these questions are trustworthy the majority of pupils of high-school age do not let the size of a book influence them unduly. Many pupils commented that size was immaterial and that content was the deciding factor in choice. All this would seem to indicate that the physical makeup of the book which is so important among smaller children is of little importance in the high-school age.

The cards mentioned above as part of the survey were used to find out why pupils like or dislike certain books. Each pupil was asked to write on a card the name of a book which she had recently read and to give the reasons why she liked or disliked it. She was also asked to give her age and year in school but not her name. With the coöperation of the English department these cards were distributed in twelve English sections of 35 girls each, ranging from first to fourth years. Ninety-four cards were distributed at random in the library in order to see if frankness of expression was hampered in the class room. These were checked separately and no difference was apparent. There were in all 514 cards. Fiction was found to be the most popular kind of book, since almost every book mentioned on these cards was a novel. The great majority of pupils chose a book which they liked and their reasons for liking the book were both interesting and enlightening. These reasons were tabulated and every one given nine times or more was included in Table V.

TABLE V

LIST OF REASONS

Mystery	Success against odds
Adventure	Humor
Character study	Parent relation
Love	Historical
Realistic	Unexpected
Girl life	Sad
Interesting	Home life
Style	Outdoor life

The reasons for enjoying books which were most frequently given were that they were mysteries, adventures, character stories, love stories, and stories of real life. The reasons vary with the grades of the pupils as, for example, mystery was given 28 times in the first year, 21 in the second, 12 in the third, and 5 in the fourth; success against odds was given 10 times in the first year, 8 in the second, 2 in the third, and 1 in the fourth; adventure was given 23 times in the first year, 20 in the second, 3 in the third, and 12 in the fourth; character study appeared 6 times in the first year, 10 in the second, 2 in the third, and 38 in the fourth; real life appeared 4 times in the first year, 4 times in the second, 16 in the third, and 18 in the fourth; style was given once in the first year, twice in the second, 3 times in the third, and 17 in the fourth. This corroborates the findings of the questionnaire where it was shown that mystery loses interest in the later year and that character stories and realistic stories increase in popularity in the higher terms. A remarkable interest in love stories is shown in the second year both on the cards and on the questionnaire.

Twenty pupils chose books which they disliked and gave very interesting reasons. Dickens' novels were mentioned four times as having too many characters and as being confusing. "Sesame and Lilies" was given twice with the reason that it was boring and had too much description. Other reasons given were "too much preaching," "disgusting sex element," "end not as expected," "first person," "insincerity—author tries to be smart," "silly," and "lack of conversation."

The third part of the survey consisted of a group of essays from a first-year class giving the kinds of books which they liked to read. From these papers a tabulation was made as in the case of the cards and it was found that the reasons for liking books agreed very well with those given on the cards for that year. Mystery stories were first with 17 votes, adventure second with 8 votes, and school stories third with 5 votes. Love stories stood very low in this particular group with only 3 votes. Series stood high with a vote of 7. This was also true on the cards of the first-year pupils. One pupil mentioned that she did not like books

read in class because they were read too slowly; another said that she did not like books read in class, but she mentioned that the school library had some good books, statements probably due to the fact that so many pupils distrust required and recommended books. There was shown in these papers a tendency to be smug, as in the case of a girl who said that she disliked fiction because it gave people foolish dreams and that it was best to select books from the reading list (presumably meaning the English reading list). While some statements on these papers must be discounted for this reason, they do on the whole agree very well with the other findings.

In the last section of the survey a study was made of the four-year reading records of 19 seniors. These records were kept from term to term by the students and gave the required reading as well as the outside reading. The outside reading only was considered here. From these lists the authors most frequently read were selected and tabulated. The same general tendency is shown as in the other tabulations. Authors such as Burnett, Fox, and Rinehart, who write simple love stories and mysteries, show the same decline in favor from the first to the fourth year. In the same way authors such as Wharton, Swinnerton, and Ostenso, who write character studies and realistic stories and are modern in tone, show a decided increase in favor in the higher terms. One of the chief interests in these records is that they agreed with and corroborated the findings of the other three parts of the survey. The fact that the records bore the pupils' names and were submitted to the teacher seems to have had slight influence in the choice of titles. Many books of inferior quality were recorded and series were extremely popular especially in the first year. There were in all 15 different series mentioned.

If the findings from this survey of one large high school may be accepted as typical of the reading interests of girls of the adolescent age, certain definite conclusions may be drawn. It seems quite safe to say that girls of this age read more fiction and like it better than anything else. It is also true that there is a definite development in reading taste from the simple love story and mystery story read in the first two years of high school up to the character studies and realistic stories read by the older pupils. The physical makeup of a book seems to have little influence on the high-school girl in choosing a book. Finally it is quite definitely shown that the taste in reading improves from term to term and the girls give evidence of a growing appreciation of better literature.

THE INFLUENCE OF PAST EXPERIENCES UPON SPELLING

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WHEN a child attempts to spell a word for the first time, what determines the particular choice and order of letters which he uses? Since the ability to spell cannot be credited to original nature, his present efforts must be ascribed to what he has learned about spelling in the past. For, although many of the spellings which he writes are indeed grotesque, they are not due to a mere chance selection and arrangement of letters. How do the child's past experiences combine in his attempts to spell words which he has not seen or written? In an article published in the *Journal of Educational Research* for January, 1929, the writer attempted to correct the naïve and erroneous, but very common, assumption that past experiences in spelling necessarily transfer in a desirable way in learning new words. Attention was called to the possibility that when a child attempts to spell a word for the first time he may be led into error by the fact that the individual sounds in the word have been spelled in a variety of ways in other words which the child has already learned to read and spell. It was shown that these various spellings of individual sounds can be combined in an enormous number of ways to make the sounds of the word as a whole. The word *circumference* was used as an illustration. The sounds in this word can be spelled in 396,900,000 ways by using the spellings of identical or similar sounds in words likely to be known to a sixth-grade child. However, the conclusion reached was that some of these combinations of letters would probably never be found, no matter how great the number of attempted spellings, since the various elements used in building up these 396,900,000 combinations are probably not free, either in the statistical sense or from the standpoint of psychology, to unite with all other elements. For example, even in a million attempts *circumference* might never be spelled psolokhoegmpphouriadnz (*ps* as in *psychology*, *olo* as in *colonel*, *kh* as in *khaki*, *oe* as in *does*, *gm* as in *diaphragm*, *pph* as in *sapphire*, *our* as in *journey*, *ia* as in *parliament*, *dn* as in *Wednesday*, and *z* as in *quartz*). On the other hand, it was pointed out that an astonishing variety of spellings is found whenever a large number of children are asked to spell a difficult word; i.e., children are exceedingly "free" in their attempts to spell.

The following paragraphs exhibit and discuss a limited variety of actual spellings of the three words *circus*, *tease*, and *miscellaneous*.

The word *circus* was chosen for the first investigation because it contains some of the same sounds which are found in *circumference*. A circus was described to first and second grade classes, aggregating 195 pupils, in two school systems. All of these children had had some training in phonics. The word *circus* was not used in the description, but the children were asked if they knew what was being described. The children easily identified the description as that of a circus. They were asked if they could write the word. Most of them expressed confidence in their ability to do so. All were requested to try to write the word. In 195 attempts the word was written in 148 ways. Table I lists the attempts which can be given the same or an approximate pronunciation of *circus*, if one uses, sound by sound, the sound values of similar letters and letter combinations in other words, and in phonic exercises.

TABLE I

THE "BEST" SPELLINGS OF *circus* BY 195 PUPILS IN GRADES I AND II

caks	1	ckaus	1	crkes	1	sacrese	1	sircus	1	srckus	3
cercacace	1	ckus	1	crkis	1	saks	1	sirecuis	1	srckuss	1
cercus	1	cracuce	1	crkks	1	scres	1	sirkos	1	srcus	20
cerks	1	crcac	1	crkpsee	1	secos	1	sracusse	1	srkase	1
cercuc	1	crees	1	crks	2	secus	1	sreas	1	srkos	1
cerckus	1	cres	1	croes	1	sgus	1	srchas	1	srks	10
circes	1	crchus	1	crokus	1	sicues	1	srchos	1	srkus	8
cires	1	crcus	5	curcas	1	sicus	1	srcis	1	srocus	1
circuse	1	crekos	1	curcuse	1	sircas	1	srckce	1	srucks	1
circus	6	crkaws	1	curicus	1	sirckers	1	srcks	1	srucs	1
						sires	1				

The most frequent spellings were *srcus*, which occurred 20 times, and *srks*, which occurred 10 times. These spellings suggest the influence of phonic exercises, as for example srks, s, r (ẽr), k (kŭ), s. The past experiences of the 108 pupils whose spellings are exhibited in the table operated in 61 different ways. The attempts of the remaining 87 pupils were farther afield, some bearing no resemblance to the word. Although all children understood the meaning of the word and had undoubtedly spelled each of the sounds in other words, no first-grade children and only 6 second-grade children spelled the word correctly. These 6 children had probably seen the word or had written it, and many of the other children had undoubtedly seen it also.

Table II shows the attempts which can be given the same or an approximate pronunciation of *tease* if one uses, sound by sound, the sound values of similar letters and letter combinations in other words, and in phonic exercises. This word was chosen because of the large number of ways in which the vowel sound and the final consonant sound are spelled in words which primary children have read or written. The children readily suggested the word in response to a description of a boy

who had annoyed a little girl in a variety of ways. As in the case of *circus*, they expressed considerable confidence in their ability to spell it. The 195 children spelled the word in 44 ways. Table II shows the 25 kinds of spellings which can be given the approximate pronunciation of *tease* if one uses, sound by sound, the sound values of similar letters and letter combinations in other words and in phonic exercises.

TABLE II

ONE HUNDRED NINETY-FIVE CHILDREN IN GRADES IA, IIB, AND IIA SPELLED *tease* IN 44 DIFFERENT WAYS. THE FOLLOWING ARE THE "BEST" SPELLINGS

	GRADE				GRADE				GRADE		
	IA	IIB	IIA		IA	IIB	IIA		IA	IIB	IIA
teese	—	—	1	teezz	1	—	—	tezz	—	1	—
tees	1	8	9	tes	24	4	16	tiees	1	—	—
tease	—	2	12	tese	1	3	2	tis	1	—	—
teez	—	3	3	tess	1	2	4	toes	—	1	—
ter	1	—	—	tesse	—	—	1	ts	3	1	—
tes	7	6	3	tesz	—	—	1	tso	1	—	—
teese	—	—	1	teus	1	—	—	tss	1	—	—
teez	3	1	5	tez	3	1	1	tuiz	1	—	—
				teze	—	2	—				

No first-grade pupil spelled this word correctly, the commonest spelling being *tes*, which was found 24 times. Only two 2B students and twelve 2A students spelled the word correctly. Probably none of the 195 students had ever spelled the word, and some of the children may not have seen it. A few more 2B students had probably seen the word and by the second half of the second grade the experiences with the word had probably become common enough to account for most, if not all, of the 12 correct spellings. Even in this grade, however, the spelling *tes* was found more frequently than the spelling *tease*. In the case of both *circus* and *tease*, the letters most often chosen to express the various sounds are those which, in primary reading, most often have the same or similar sound values.[1] For example, the vowel sound in *tease* was most often spelled with *e* as in *be*, *ee* as in *teeth*, and *ea* as in *tea*. The spellings *ey*, *eo*, and *ei* were not found, although used to spell the same vowel sound in words which are found in primary readers, as for example, in *key*, *people*, and *neither*.

Tables II and III show how children of the primary grades are confused by the great variety of ways in which identical or similar sounds can be spelled in English. No less interesting exhibits can be made of the variety of spellings on the part of the students in more advanced

[1] For frequency counts of the spellings of various sounds in primary reading see Cordts, Anna D. "An Analysis and Classification of the Sounds of English Words in a Primary Reading Vocabulary." Ph.D. Thesis, unpublished, State University of Iowa, 1925.

grades. A number of the spelling investigations completed by graduate students at the State University of Iowa include lists of actual spellings by older children. In these lists an astonishing variety of spellings is shown for the same word even at eighth-grade, twelfth-grade, and senior-college level. Masters[2] gave as a spelling test a list of difficult words to 200 eighth-grade students, 200 twelfth-grade students, and 200 college seniors. Among the words in the list was *miscellaneous*, which was spelled correctly by 36 eighth-grade students, 130 twelfth-grade students, and 149 college seniors. Eighth-grade students made 113 different types of errors and twelfth-grade students 40 types of errors. Even college seniors misspelled the word in 22 different ways. Taking all misspellings of all students, 153 different incorrect forms were found. Table III shows 85 different incorrect forms which, if compared sound by sound with spellings of identical or similar sounds in other words, may be considered as making or approximating the sounds in *miscellaneous*.

TABLE III

	GRADE VIII	GRADE XII	COLLEGE SENIORS		GRADE VIII	GRADE XII	COLLEGE SENIORS
				miscleaneous			1
mecelaneous	1			miscllanious	1		
mecelenious			1	miscolaneous	1		
mesalaneous		1					
				misealineus		1	
mescelaneous	2			miselaneous	2		
misscellaneous	1		1	miselanious	2		
mesellaneous			1				
				misellaneous			1
mesoleanious		1		misellanious	2		
messelonious	1			misilainious	1		
miccellaneous	1	1					
			1	misilanious	3		
micelaneous				misillaneous	1		
micelanious	2	1		misillanious	1		
micellaneous	1	1	2				
				misolaineus	1		
micellanious	1			misolainious	1		
micelouseus	1			misolaneous	4		
micilanious	1						
				misolanious	1		
micillanious	1			misolanius	2		
misalainious		1		misolaoneous	1		
misalaneous	2		1				
				missalaneis	1		
misalanious	6			missalaneous	1	1	
misalanius	1			missalanious	1		
misalenious	1						
				missalianious	1		
misallaneous		1		missallaneous	1		
misallanious	2	1		missallanious		1	
miscalanias	1						
				missalneous	1		
miscalanious	1			missselainious	2		
miscallaneous	1			misscelanious			1
miscelaneous		4	12				

[2] Masters, Harry V. "A Study of Spelling Errors," Ph.D. Thesis, State University of Iowa, 1927. *University of Iowa Studies in Education*, Vol. IV, No. 4, Sept. 1, 1927. For other lists of varied spellings see McKee, Paul. "Teaching and Testing Spelling by Column and Context Form." Ph.D. Thesis, State University of Iowa, 1924.

miscelanias	1			misscellaneous		1	
miscelanious	3	2		misselaneous			3
misclanius	1			misselanious	5		
misceleanious			1	missellanious	1		
miscelenious		1	1	missilainious		1	
miscelainious	1			missilaneous			1
miscellanias		1		missilanious	2	2	
miscellanious	7	16	6	missilaniouss	1		
miscelleanious		1		misslinious		1	
miscellenious		1		missolainious	1		
miscellianeous		1		missolaneous	1		
miscilanious	1	1		missolanious	4		
miscillaneous	1			missulanious	2		
miscillanious	1	2		missulianias		1	
misclanious			1	misulanies	1		
				musolanious	1		

It seems probable that these misspellings are caused at least in part by transfers from spellings of identical or similar sounds in words which the student knows (or thinks he knows) how to spell.

The 153 incorrect forms reported by Masters are, of course, very much less than the total possible ways in which the sounds of the word can be made by combining the various ways in which similar or identical sounds are spelled in other words. The number of theoretically possible spellings would probably approach that earlier given for *circumference*. It would be interesting to know how many different spellings would be actually recorded in, say, 100,000 attempts on the part of eighth-grade students.

It would be interesting also to know in the case of each student why the particular spelling contributed by him was written. Each student had met in past reading and writing many other ways of making each of the sounds in this word. There must have been some cause which, if known, would account for each particular combination of letters. Undoubtedly many students would have spelled the word differently if tested a week, a day, or even an hour later. While one can conjecture as to probable causes, among which would be the frequency with which the sound has been met, the vividness of the experience, and the recency with which the sound has been met, it is doubtful whether the most reliable and best trained introspectionist could report the causes which would account for each letter used by him in spelling a new and difficult word.

A study of the data presented in these tables helps to explain why special devices for calling attention to the "hard spot" in a word have not proved efficient. In the first place, difficult words with a single hard spot are the exception rather than the rule. There are, of course, some

such words. Naturally, the number of different hard spots in a word tend to decrease as experience in spelling increases. In the second place, the hard spot for one student is not necessarily the hard spot for another. The way for any student to discover the part of any word that is hard for him is to attempt to spell it. Partly, no doubt, for reasons just enumerated, direct experiments in marking hard spots have not only failed to show superior results, but also have failed to show results as good as are obtained without the use of such devices.[3]

The tables also help to explain why, in teaching spelling, the chief dependence must be placed on learning each word as an individual problem. The more one studies the problems created by the unphonetic character of English spelling, the more he must marvel at the ease and rapidity with which many students learn to spell. For example, the sound *ĕr* in *circus* can be spelled accurately or approximately in the following ways: *ir* as in *first*, *er* as in *fern*, *or* as in *word*, *ur* as in *fur*, *our* as in *journey*, *ear* as in *search*, *ere* as in *were*, *ure* as in *measure*, *err* as in *err*, *oar* as in *cupboard*, *oir* as in *avoirdupois*, *eur* as in *chauffeur*, *olo*, as in *colonel*, *ro* as in *iron*, *re* as in *acre*, *yr* as in *myrtle*, *yrrh* as in *myrrh*, *irr* as in *firry*, *urr* as in *hurry*, *orr* as in *worry*, or *ar* as in *parental*. There is no rational principle by which the child can determine why *ir* happens to be the spelling to choose from all this list. The most helpful principles in spelling are those which apply to adding prefixes and suffixes, to making contractions, and to indicating possession. Even these principles should reinforce rather than surplant, instruction on the most important words to which they apply. And to those who in desperation plead for simplified spelling, it should be pointed out that, as far as public schools are concerned, such a plan involves practical difficulties which are at present insurmountable. Not the least of these difficulties is the lack of agreement among phoneticians as to how words should be pronounced and transcribed.

[3] Tireman, Loyd S. "The Value of Marking Hard Spots in Spelling." Ph.D. Thesis, State University of Iowa, 1927.

EDITORIALS

THE EXPERIMENTAL STUDY OF TEACHING

Some years ago a Committee of the National Society for the Study of Education set itself to list principles of method for the different elementary school subjects. It was the purpose of this Committee to list experimentally determined principles of teaching. While this report has now been almost forgotten, the idea which prompted it is highly commendable. Although teaching is an exceedingly complex activity and does not lend itself so readily as some other aspects of education to experimental study, to study it experimentally is important. It is important not merely because it is an essential aspect of professional education, which is in need of improvement, but because it is the effective meeting point of education and the other sciences in teacher-training institutions. To a considerable extent, one's academic colleagues in teacher-training institutions, colleges and universities, and to some extent the general public, get their notions of the character of professional education through the attitudes and attainments of students enrolled in general and special methods courses.

To our critics education frequently appears only as a large assortment of tricks and devices. To a certain extent it is true that methods courses are composed mainly of tricks and devices; for example, the discussions of methods of the recitation which concern taking attendance; collecting and distributing materials; systems of punishments, and rewards; techniques of asking questions; types of assignments; the checking of outside reading; the grading of examinations; etc. Every generation has its assortment of devices: the socialized recitation, the topical method; the problem-project method; the unit-contract method; etc. Because of this situation, education is sometimes spoken of as superficial.

If we think of methods courses as composed of tricks and devices instead of principles, and if we think of tricks and devices as surface matters rather than as more fundamental matters, teaching courses are certainly superficial. Deeper down there must be, however, if we take the trouble to search for them, some fundamental principles of good teaching. It would seem important that these determiners of good teaching be located. Having once settled upon some of these more important characteristics of good teaching, we might then evaluate the teaching devices which we now have somewhat more expeditiously than we now can, and produce new crops of them with greater facility.

It is not the writer's point that devices are useless but that it is educationally uneconomical (poor pedagogy) to deal with them on the device level. It appears to the writer that it would be much better education and much better statesmanship to spend more time talking about the principles of teaching and less time talking about devices of teaching. Thus, there might yet be plenty of science and of individuality in one's teaching.

The tendency to deal with teaching on a device level is also apparent in the experimental studies of this subject. Most of the studies of teaching that one comes upon are comparative studies of teaching devices and systems. Again, while such research appears to the writer to be important, it seems however not to be basic. There is no field of professional education in which the research is so scrappy, disconnected, and unrelated as in the field of method. Of course, to verify even one principle is a laborious task. Such a principle would have to be subjected to many experimental evaluations, testing its application to subjects and parts of subjects, to pupils of different mentality, training and experience and to many different situations that constitute the conditions of its application to classroom instruction. While such an undertaking is a laborious one, the returns should be worthy of the effort.

A. S. B.

REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

WHEELER, CARLETON A., AND OTHERS. *Enrollment in the Foreign Languages in Secondary Schools and Colleges of the United States.* New York: The Macmillan Company, 1928. xxi + 453 pp.

HENMON, V. A. C. *Achievement Tests in the Modern Foreign Languages.* New York: The Macmillan Company, 1928. xxvi + 363 pp.

Publications of the American and Canadian Committees on Modern Languages, Volume VI, *Modern Language Instruction in Canada.* Toronto: The University of Toronto Press, 1928, Volume I.

Publications of the American and Canadian Committees on Modern Languages, Volume VII, *Modern Language Instruction in Canada.* Toronto: The University of Toronto Press, 1928, Volume II.

One by one the publications of the American and Canadian Committees on Modern Languages are coming from the press. Volume I, *The New York Experiments with New Type Modern Language Tests,* was reviewed in these columns some months ago. Volume III, *Graded Spanish Word Book,* appeared in 1927 and received some notice at that time. The above volumes which constitute Volumes IV to VII inclusive of the XVII volume series which were projected for the complete report of the Modern Foreign Language Study have recently come to our desk. Each is deserving of the limited amount of space which we give to book reviews, yet it has been thought proper to discuss briefly the four volumes since largely those interested in one, will be interested in the others also.

In the first volume mentioned above Professor Wheeler has analyzed and summarized the statistics of enrollment in a most excellent manner. Having secured data on approximately 90 percent of the enrollment in the public schools and probably 60 percent of that in the private schools, he is able to estimate very accurately the status of the modern languages in the school curriculum. His figures indicate that approximately 20 percent of the total public secondary school enrollment is studying a modern foreign language. The data are classified by size of community, type of school, geographical location, even on the basis of individual states.

In the next volume Dr. Henmon discusses the results of the achievement tests, discusses the devising of the achievement tests and the resultant scores. Comparisons are made as between American, Canadian and English schools in terms of the achievement by semester and year on various phases of language study such as vocabulary, grammar, silent reading and composition. In general, these results seem to indicate that the results obtained in American public high schools compare most favorably with the results attained in Canadian and English schools, even when

allowance is made for the larger number of periods per week which are ordinarily given in the American schools.

The third volume devoted to Modern Language Instruction in Canada, deals very extensively with an annotated bibliography on Aims and Methods, Language, The Learning Process, and Tests and Examinations. Then follows an extensive list of problems for investigation, a consideration of the age for beginning language study, a consideration of errors which appear in French examination papers and two experiments in teaching. The bibliography phase is exceedingly valuable covering the field in a most exhaustive manner with a concise brief or annotation of content given for each book and article. This bibliography is reprinted as Volume VIII of the entire series.

The last volume covers the history of modern languages in Canada, conditions and practices, the training of teachers, and a considerable section devoted to the results of the language tests.

Each volume in its own way contains very valuable material to teachers in this field. A knowledge of the extent to which modern language work is being carried on in secondary schools shows at once both the need for trained teachers and the probability of students who enter the higher institutions having done some work in modern language.

In devising valid tests for school achievement in this field the study has been most valuable. Whereas in the past the evaluation of language teaching had to rest upon the subjective judgment of the appraiser, in the future neither administrator nor teacher need be ignorant of the accomplishment of pupils in their charge.

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Ohio State University

KOOS, LEONARD V. *The Questionnaire in Education.* New York: The Macmillan Company, 1928. vii + 178 pp.

In *The Questionnaire in Education*, Mr. Koos has dealt with the method most commonly used in educational research—the questionnaire. The manual presents the findings of an analysis of a large number of questionnaire investigations, and a comparison of these findings with those of other methods of investigation. The author purports his study to be "a combined critique of the questionnaire and a manual of directions for its proper use."

The questionnaire has come into disrepute in many quarters because of its misuse and abuse. Approximately one-fourth of all the investigations reported in nine educational periodicals employed the questionnaire method. The method is found to be applied in many divisions and on all levels of the field of education to ascertain practices, basic data, and judgments. Mr. Koos characterizes the questionnaire method as a valuable source of data which are procurable usually in no other way. Two criteria—(1) ability, and (2) willingness of the persons approached to make reliable answers—are proposed for the appraisal of questions and questionnaires. The author concludes that the method should be regarded as a respectable method of investigation in education. He has formulated a set of fourteen concise and helpful recommendations. The manual contains much that is practical in the way of suggestions for conducting research in education.

In spite of the many commendable features, a certain inadequacy might be pointed out. Mr. Koos might well have included with great advantage to the research student, more illustrative material. The student is interested in

having at hand various types of questionnaires, which, in the judgment of the expert, are desirable and those which are undesirable. Thus may the student be better guided in his own use of this device in his investigation.

This monograph will undoubtedly prove of immense value and interest to students carrying on educational research by means of questionnaire studies. If this method is to be used, it will be better used as a result of this book.

RHUE E. GREEN

Ohio State University

HOLLEY, CHARLES ELMER. *Modern Principles and the Elementary Teacher's Technique.* New York: The Century Company, 1928. x + 431 pp.

This book is announced by the publishers as a "textbook for beginning courses in methods for the elementary teacher." Following the customary organization of such texts, the early chapters are devoted to a discussion of "principles," while the later ones are concerned with the application of these principles to specific school subjects. At the close of each chapter are supplied "exercises" and a list of "suggested readings." The exercises present problems dealing with the general matter under discussion rather than the all-too-frequent inane questions upon the text.

The chapters dealing with principles treat such topics as "Discipline," "Group Methods," "Subject-Matter," "Thinking," etc. Part II of the book devotes separate chapters to each of the major subjects of the elementary curriculum. These chapters are organized on the basis of a common outline, each subject being discussed under the following headings: "I. Special Conditions Favorable to Good Work," "II. Major Objectives," "III. Drill Aspects," "IV. Knowledge Aspects," "V. Emotional Aspects," "VI. Opportunities for the Development of Individuality," "VII. Projects and Problems," "VIII. Remedial Work and Supervised Study."

The author has undertaken the task of presenting the rather hazy problem of methods to those who are without the background of practical experience. Many helpful hints and directions are given. In some instances these seem sufficiently specific to be understood by any ordinary reader. But at many places the inexperienced student will likely have difficulty in visualizing the situation under discussion and making the application. More concrete illustrations would aid the student in interpreting the text.

Statements here and there throughout the book give us a glimpse of the author's educational philosophy, with which, in many instances, the reviewer could not agree. The teacher is advised at various places to follow the textbook "slavishly." "Rule-of-thumb" methods are favored in cases where explanations are likely to prove difficult for the child. Certain skills are classed as ideo-motor action. Whether activities be mental or physical "the same teaching method applies to all. They are learned by doing the desired thing in exactly the same way each time." (p. 114) "Morons often can be educated to a surprisingly high level, but it usually is not worth the cost to carry their education very far." (p. 368) The socialized recitation seems to be regarded largely as a matter of parliamentary organization and, in consequence, the author feels that "it will have to be reserved largely for the content phases of the school work." (p. 100)

Failure to agree with an author is no criticism of his book. This one has

merit and will stand comparison with others in its field. The reviewer feels, however, that it will likely prove more valuable to the teacher of slight experience, who has begun to sense the problems and difficulties of the school room, than to the inexperienced student.

VELORUS MARTZ

Indiana University

FULLER, FLORENCE D. *Scientific Evaluation of Text Books.* Riverside Educational Monographs. Boston: Houghton Mifflin Co., 1928.

A report of a singularly objective attempt to appraise the total teaching service of eighteen texts for junior high school mathematics. The fundamental theorem upon which the appraisal of the texts studied was based is: List a series of describable aspects of a text; provide enough specific items under each aspect to practically force a series of specific judgments in contrast to vague and general opinions; use many judgments rather than one in reacting to each item. Average many specific judgments; weigh the results under each main aspect in a reasonable fashion. The resulting total score will give an objective appraisal of the several texts from which appraisal several untrustworthy influences will be separated.

The main contribution of this competent monograph is its demonstration that objective appraisal of texts is a practical procedure instead of only a favorite topic for academic discussion. It is apparent that the work was prosecuted with vigor and a generous but not overwhelming amount of insight into the vital issues involved. In a sense it is a super-score card and is distinctly superior to any technique based on superficial score cards. It is, however, limited by absence of several opportunities for qualitative analysis which would have been exceedingly useful. It strikes deeply and adeptly into the center of a fundamental problem,—that of selection of texts. It is hoped that further similar work by the same author will strike even deeper into the same problem. Since no review is complete without at least two or three unfavorable comments, it might be added that the work of selection was probably more carefully done than was the work of constructing the texts themselves and that no data are presented to oppose the suspicion that another committee using the same technique might not have awarded the victory to another text. That is, no evidence of the reliability of the findings is offered. Further, several of the criteria assumed to suggest desirable aspects of a text are of very doubtful validity. In some cases the exact opposites of the criteria used would have been more defensible. A few (but only a few) major considerations of good texts were omitted entirely.

F. B. KNIGHT

State University of Iowa

ALPERT, AUGUSTA. *The Solving of Problem-Situations By Pre-School Children: An Analysis.* Teachers College, Columbia University, Contributions to Education, No. 323, 1928.

Teachers and school supervisors do not seek professional guidance in doctors' dissertations on psychology. The studies are regarded, not without some justification, as exercises in research technique. Their application to school or home training of children is often either limited or negligible. Dr. Alpert's contribution does more than gain, for its writer, admission to the fraternity of doctors of philosophy. It sheds revealing light on the questions concerning intelligence and indicates possible relationships between

animal and human behavior, relationships hardly suspected a generation ago.

Reliable studies of animal psychology are very recent. In James, one finds a critical attitude towards interesting animal yarns but no real inquiry designed to yield objective data.

Thorndike, studying the cat in the puzzle-box failed to find any reaction that "even seemed due to reasoning." To get to the food, Thorndike's animals made a variety of primitive movements like reaching, clawing, pushing, but never intentionally undertook a line of action designed to yield a definite result. Whatever success they achieved was always accidental. With each succeeding effort, it was evident that the animals were learning but the learning was "slow and stupid".

Wolfgang Koehler advanced our knowledge of animal psychology by his discovery that the mentality of apes was not without resemblance to that exhibited by humans. Koehler's apes wandered about in an accustomed play place having three solid walls, a fourth wall of iron bars and a roof of wire mesh. Food was suspended from the wire ceiling or placed outside the cage, always in full view but beyond the unaided reach of the creatures. Into this cage were introduced boxes which, when used as a platform, elevated the apes sufficiently to enable them to reach some coveted bananas. Sticks and ropes, conveniently placed also enabled the animals to get the food. The bananas were then placed so far from the cage that they could not be reached by any one of the sticks; for a single instrument of adequate length, at least two of them had to be fastened, end to end. In like manner, the food was hung so high that no one box gave enough elevation but required the pyramiding of two boxes before it could be grasped. So well did the apes use the boxes and the sticks that Koehler felt he had sanction for concluding that his chimpanzees exhibited "intelligent behavior of the general kind familiar to human beings" and that "the type of intelligent conduct can always be traced." In other words, any line of conduct carried out by the apes could have been identified as a definite type of thinking.

The full significance of Koehler's experiments lies in their implications that intelligence is not a discrete function possessed exclusively by human beings, but rather a set of functions, revealed in more limited modes and in less degree, but revealed nevertheless in animals as in human beings.

Dr. Alpert set herself the task of studying and solving the behavior of children; especially was she concerned with the solving methods adopted by preschool children when they are confronted by problem-situations. Such inquiry, she felt, might yield data for making comparisons of problem solving behavior by children with that exhibited by apes. Forty-four children with age ranges of 19 to 49 months were used as subjects. They were introduced into test situations not unlike those created by Koehler. Attractive toys (balloon, duck, dog, airplane) were suspended from the ceiling or placed outside of a confining play pen similar to those seen frequently in homes. These toys, like Koehler's bananas, were beyond the reach of the children. Blocks, boxes, and sticks adequate to extend the child's reach were placed within ready access.

The failure of four children to make any attempt to solve the problems that confronted them is ascribed, by the author, to "social and emotional immaturity." The responses of the others were primitive, random, explanatory, or eliminative. Whatever the method, it

showed a characteristic emotional tone,—distress, anger, curiosity,—and tempo. No child adhered to any one type of solution but made changes as the situation itself changed. As might have been expected the exploratory and the eliminative types of problem solution were employed more frequently than any of the others. A significant inference from the observations of the problem solving behavior of the children is that in a problem situation a point is reached, on occasions, fortuitously, to be sure, when the experience is perceived as a new or a reorganized whole. This moment of insight is the turning point in the behavior and expresses itself spectacularly through facial expressions, body movement or verbal exclamation.

In both apes and children the characteristic initial movement was a primitive response as evidenced by vain reachings towards the object, but with the growing familiarity with tools primal reactions became less frequent. Random responses to a problem situation were relatively as infrequent among the children as among the apes while exploration and elimination were most frequently employed by both. The author observes that the apes exhibited greater variety and ingenuity in these modes of solution. "Exploration and partial insight of the complete field occurs in about the same proportion among apes as among children . . . As with the children, so with the apes, Exploration and Elimination is often abandoned for the Primitive or Random Response when the subject is fatigued or at the end of his mental resources or disinterested." (p. 53) "Both apes and children will repeat a solution just to enjoy a newly discovered stunt." Both, when unable to reach an object derived marked satisfaction from establishing a useless contact with it by throwing something at it or sending a stick towards it until the goal was touched.

Dr. Alpert has done her task well. She set herself against the many temptations to take occasional excursions into realms subjective and speculative and clung tenaciously and courageously to her purpose. The work is accurate and circumscribed by objective data objectively derived. The regret that she had only forty-four children leads one to hope that she will repeat her study with other groups of children less carefully or more specifically selected and that she will amplify the explanation of the processes by which the moment of insight is reached in a problem-solving situation. Her data are too limited for a more adequate exposition of the temporal relationship between insight into a problem and its solution. Does insight into a problem precede, follow or coincide with the objective solution? Out of a relatively limited experience Dr. Alpert has wrung much that is extrinsically as well as intrinsically vital to the understanding of the human thought processes. Her book is happily free from needless statistical refinements, a common superfluity, in doctorate dissertations in the field of the Social Sciences, introduced, so often, to create a spurious sense of scholarship and intellectual travail. Dr. Alpert realized the character of her material and skillfully devised appropriate research technique.

The biologist promises to become the true psychologist of the future. Not a few psychologists have become so imbued with the evolutionary principle of life that they look in lower animals for the sanctions concerning their generalizations about human psychology. Much that was taught by the professors of psychology only a generation ago has been laid low with the increasing knowledge of instincts and inherited mechanism of be-

havior. As we learn more of the nature of animal psychology, we may gradually set aside our current conceptions of human intelligence,—conceptions so frequently born of the speculative and introspective psychology of yesterday. We may begin to regard mind, as we do the body, as the product of an evolutionary development rather than as a discrete function bestowed exclusively upon man who, divinely selected for preferential treatment, was made the final achievement among living things.

PAUL KLAPPER
College of the City of New York

ENGELHARDT, N. L. *School Building Programs in American Cities.* New York: Bureau of Publications, Teachers College, Columbia University, 1928. 560 pp.

This volume is another valuable addition to the several books in educational administration that have been prepared by members of the department of educational administration at Teachers College. This book is written with the same general care and precision as was "A School Building Program for Cities" by the same author in 1918.

"School Building Programs in American Cities" presents the school building conditions and needs in ten cities. These cities are located in different parts of the United States and vary in population from 5000 to 100,000. One hundred twenty-seven maps showing distributions of residences, locations of present school plants, proposed school buildings, residential and non-residential areas, overlappings of areas served by school buildings, distributions of students by races and other facts that have a bearing on the adequacy of existing school plants as well as future building needs are shown. Different types of data needed in building programs are arranged in one hundred nineteen tables and twenty-three charts are used to graphically present some of the facts that are used in these studies. Seventy illustrations picture desirable and undesirable phases of school buildings and surroundings. For each city included in the study there are definite recommendations which were formulated after all the collected data were compiled and evaluated.

This volume is especially helpful in all courses in educational administration where school buildings and school building programs constitute a part of the material of the course. Copies of this publication should be provided for the superintendent's library and any city which is contemplating a building program can obtain constructive suggestions as to procedures in school building surveys. Workers in the field of educational administration will welcome this compilation of studies made in the field of school management. The objective and scientific measures used by Dr. Engelhardt are now extant in the practices of wide-awake school administrators.

J. W. TWENTE
University of Kansas

DORRIS, ANNA VERONA. *Visual Instruction in the Public Schools.* New York: Ginn and Company, 1928. x + 481 pp.

Miss Dorris's book fills a long felt need. There have been other books whose titles would lead one to believe that they are what this one actually is, but they are not. Here is a book on the much discussed subject of visual instruction which is something more than a trade catalogue, a compilation of useless statistics, or a doctor's dissertation padded up to book length. No progressive teacher or school authority can afford to pass it unread, or to be without

it for reference. Part I treats of the background of visual instruction; Part II shows how to apply visual instruction to teaching various subjects, and Part III deals with administrative problems. A very comprehensive list of supply sources is given in Appendix A and an equally valuable list of special materials for various subjects is furnished in Appendix B.

Miss Dorris is well equipped to handle her subject authoritatively as she is president of the Visual Instruction Section of the N. E. A. and is head of the Visual Instruction Department of California State Teachers' College. The book is pedagogical from cover to cover and will do much to draw the attention of every one interested in the cause of education to this new-old factor in instruction. As Miss Dorris aptly points out, "Through the use of visual instruction many economies are made possible; for it naturally follows that results are more definite and are secured in much less time. Indeed if visual aids are sufficiently and properly used, the greater load put upon the school in recent years may be satisfactorily carried without prolonging the child's period of training and with much greater benefit to him in equipping him for life's duties."

Miss Dorris, not being an engineer, inventor, photographer, or mechanic, all of whom play a part in furthering the cause of visual instruction, carefully avoids such matters and for the most part remains on ground with which she is familiar. It is only when she steps from the field of pedagogy that she slips at all. The paper film discussion is a specific case. But "Visual Instruction in the Public Schools" will go down in the annals as the *first* book of its kind ever written, and it will be sometime before anyone does anything any better on this subject.

B. A. AUGHINBAUGH
State Supervisor of Visual Instruction for Ohio

Vocational Information. (A Bibliography for College and High School Students.) University of Michigan, Official Publication, Vol. XXX, No. 15, October 13, 1928. 236 pp.

This publication is notable as evidence that state universities are increasingly recognizing their obligation (1) to provide education of practical, occupational character; (2) to provide occupational "counsel"; (3) to make dependable information the basis, in part, at least, of effective choice and preparation. It is probably worthy of notice, also, that the publication is the work of "educators," rather than of "narrow vocationalists." As evidenced in the foreword, the committee which prepared this publication attempts to avoid the possible weakness of "vocational guidance" by use of the term "counsel." Yet social-economic determinism by any name (whether "guidance" or "counsel") is equally odious; moreover, in designating its informational reference as "Vocational," the committee may appear to exclude data on "professional" levels. At any rate, the committee has defined the only acceptable concept of service limited to reading; viz., making available dependable information upon which, in part, intelligent occupational choice may be based. And any institution of learning which aspires to more exact service to its students than "education" may well follow the example set by the University of Michigan in this publication as a preliminary step.

WM. H. STONE
Ohio State University

BURGESS, MAY AYRES. *Nurses, Patients, and Pocketbooks.* Report of a Study of the Economics of Nursing Conducted by the Committee on the Grading of Nursing Schools. New York City, 1928. xii + 618 pp.

In this volume we may find extensive data on nursing from three points of view,—that of nurses, doctors, and patients. The Committee on the Grading of Nursing Schools recognized that they could not grade Nursing Schools until they knew accurately the present status of nursing with respect to provision for their training, the need for nurses, and the present supply. Consequently in a thoroughly scientific manner they set to work to ascertain where nurses are trained and why, the present supply of nurses, the probable supply during the next forty years, the amount of nursing service which society wants and is willing to pay for at the present time, the conditions under which nurses work, both during training and afterward, and the attitude toward nursing service held by physicians and patients. The report is presented in a series of twenty-eight chapters, fortified by seventy tables and sixty-one diagrams.

Of course, it was impossible for the committee to secure accurate information regarding all schools of nursing, all registries for nurses, and all nurses. It was likewise impossible to secure statements from all the physicians and all the patients as to the kind of nursing service which they have had and the kind which they desire. However, the figures secured and the method of securing them impress a careful reader with their validity and reliability. It would seem that accurate forecasts could be made from the very large number of schools and nurses from whom returns were secured. If anything, as Mrs. Burgess points out a number of times in her report, the figures are low rather than high and the whole report is conservative. With one or two exceptions the statistics involved are simple and in those cases expert advice was utilized.

The very extensive quotations from those called upon to answer questionnaires impress one by their frankness. It is apparent that a free expression of personal opinion was secured and one reading these quotations feels confident that they have not been edited for the purpose of presenting any particular point of view.

The committee has done a tremendous piece of work which should be very valuable in helping hospitals determine policies with respect to training nurses; physicians to appreciate even more fully the point of view of nurses; the nurses to understand better the status and prospects of their profession; and the general public to see the significance of nursing as a field of service.

Educational counselors should read the book as a source of most valuable information regarding the outlook for this line of work. The data show that there are now more nurses than doctors, fully as many nurses as society seems to desire and is willing to pay for, and that a real crisis faces the profession unless schools for nursing take radical steps toward raising the educational and social background requirements for entrance.

E. J. ASHBAUGH
Ohio State University

FRANZEN, CARL G. F., AND STANFORTH, A. T. *Observation and Study Manual.* Columbus: The School Specialty Press, 1929.

As the title suggests, this manual is designed as a notebook and guide for observation classes in teacher training institutions. Its compilers suggest that its general character should make it usable in "any elementary junior or senior high-school subject."

The manual is made up of twenty-three units covering the conventional phases of the recitation, types of teaching, questioning, supervised study, testing, etc. Each unit occupies four pages and each is divided into three parts. (1) *Introductory Study.* A series of questions dealing with the unit are asked and a number of references are cited. These references are somewhat meager but are well selected. This phase of the unit is supposed to serve as a preparation for the student. Presumably one or more conferences would be held by the person in charge of the observation, in which the unit would be carefully discussed. (2) *Observation Record* with questions and blank spaces for comment. For example, in the unit on the *assignment*, the student is asked such questions as: "At what time during the period was the assignment made? To what degree was the assignment definite?, etc." Space for a short answer (possibly 50 words) is provided. (3) *Problems.* Under this caption, the compilers have suggested several problems which grow out of the study and observation. Ample space is provided for solutions.

The units are well chosen and logically organized, the questions are stimulating and the references are without doubt among the best in the general method field. It will serve very well the purpose for which it is intended. However, like most other manuals of this nature, its use is limited to a certain type of organization of observation work, i.e., the manual evidently presupposes an intensive study of method prior to the observations; observations in addition to those provided, in the field of the student's specialization; and a rather closely coördinated system of observation and demonstration teaching. Since every teacher training institution has its own peculiar organization, it is usually necessary for it to develop its own system for conducting courses in observation.

Ohio State University H. B. ALBERTY

SMITH, H. L., AND WRIGHT, W. W. *Tests and Measurements.* New York: Silver, Burdett & Company, 1928. vi + 540 pp.

This volume is an attempt to cover the whole field of tests and measurements in both elementary and secondary schools. Moreover, it presents not only the bare bones of the tests and scales, but it sets out the objectives of each school subject so that the reader has clearly in mind what the various tests described are trying to measure. Aids in the interpretation of results are also given.

The book is, in general, well written and readable. It makes no attempt to describe all of the tests and scales which have been devised and of course, this allows a difference of opinion as to the relative merits of those tests which have been selected for mention and description. In the mind of the reviewer the choice has, in the main, been very good.

One short chapter is given to the description of intelligence tests and one to the new type of examinations. These are perhaps the weakest chapters of the text. It seems quite impossible to describe intelligence tests adequately in such a brief space, and the illustration of the scoring of the Binet tests, including as it does, only the performances for a single year group, is distinctly misleading. It would have been better had this chapter been omitted entirely. Also some of the exercises used to illustrate new types of examinations are quite faulty.

The criticisms offered however, apply to a very small portion of the book which, as a whole, is so well done as to constitute a distinct contribution to the literature on measurement.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

CHAPIN, F. STUART, AND MEHUS, O. MYKING. *Extra-curricular Activities at the University of Minnesota*. Minneapolis: University of Minnesota Press, 1929.

A survey of student activities at the University of Minnesota for the year 1924-25. There were altogether some 300 campus organizations. When these campus organizations were studied historically, it was found that they come and go, since out of a total of 533 some 233 dropped out of existence between 1887 and 1925. Upper-classmen were more active than under-classmen, and women were, in general, more active than men. Taking all returns, more than one-third of the students attend church or do religious work off the campus. There is a steady increase in percentage of men who participate in religious organizations from freshman to the senior year. Slightly over one-third of the students earn money while attending the University. One-third of the students report that they do not participate in any extra-curricular activities on the campus. The largest proportion of these are freshmen. About forty percent of the student body engage in two or more activities. Senior college students are more active than junior college students, and women are more active than men. The period of greatest activity is in the senior year. The more activities a student leader is engaged in, the more intensive becomes his activity in them. A study of the relationship between participation in extra-curricular activities and academic achievement showed that the more active group attained a higher academic achievement than the less active groups.

The report concludes that students may take part actively in extra-curricular affairs without great sacrifice to academic standing. The returns from this comprehensive survey seem to point to the fact of the social and educational advantages accruing from extra-curricular activities. It seems that extra-curricular activities serve a real function in developing social intelligence.

NATIONAL EDUCATION ASSOCIATION. "Can the States Afford to Educate Their Children?" Washington, D. C.: *Research Bulletin of the National Education Association*, January, 1929.

This bulletin presents data on school costs and income, state wealth and value of school property, state investments, expenditures for schools, luxuries and school costs, and tax commissions and school costs. Selected bibliographies are presented on state revenues for the purpose of education, apportionment of state aid to public schools, financial aspects of certain administrative problems including county unit of school support, state regulation of teachers' salaries, state teachers' retirement systems, state school budgeting, and economic resources and school costs.

ODELL, C. W. "A Critical Study of Measures of Achievement Relative to Capacity." Urbana: *University of Illinois Bulletin No. 45*, Bureau of Educational Research, College of Education, University of Illinois, 1929.

After defining the several measures of achievement, namely, achievement age, accomplishment age, attainment age, subject age, educational age, and measures of intelligence and such relative measures as intelligence quotients, mental indices, educational indices, subject quotients, educational quotients, and accomplishment quotients, the author describes measures of achievement in relation to capacity such as achievement quotients, accomplishment quotients, attainment quotients, achievement ratios, accomplishment ratios, subject ratios, efficiency quotients, and difference measures such as Pintner's difference and Symond's index of studiousness, giving data relative to the validity and reliability of each. The author recommends: that "quotient" be used rather than "ratio" and, therefore, "achievement quotient" or "accomplishment quotient" be applied to achievement or accomplishment age divided by mental age; that "subject quotient" and "educational quotient" be employed when the divisor is chronological age; that Symonds' "index of effort" be employed where satisfactory quotient measures are not available; and that the other suggested measures be dropped either because they require too elaborate computation or because they are not needed. The comparison of achievement with mental age is more significant than that with chronological age. Franzen's concept of an A.Q. of 100 as the theoretical maximum is erroneous; an A.Q. of this size is just average. The validity of most quotient measures is not very high, chiefly because the units in the numerator and denominator are not equivalent. The proposals for improving this condition appear to be too complicated to receive general use.

A review of all known studies of the reliability of measures of achievement relative to capacity leads to the conclusion that their reliability is decidedly unsatisfactory. This is supported by original data obtained and presented by the writer. Indeed, their reliability is so low that it is recommended that they never be employed for the diagnosis, classification, or other treatment of individual pupils except possibly when they are based upon the combined results from several group tests or one individual intelligence test. Relative measures, for a class or larger group do, however, possess high enough reliability to warrant their use.

ORLEANS, JACOB S. *Report of the Fifth Annual Nation-Wide Testing Survey conducted through the use of the Public School Achievement Tests.* Bloomington, Illinois: Public School Publishing Company, 1929.

Nation-wide medians and percentiles are given for reading, arithmetic computation, arithmetic reasoning, language usage, history, geography, nature study, and health. These data are further analyzed by sections of the country and type of schools, such as, rural, town, and city schools.

WALKER, W. F. "Public Health Work in Fargo (North Dakota): An Appraisal." *Bulletin No. 3 of the Child Health Demonstration Committee.* New York: The Commonwealth Fund, Division of Publications, 1928.

The report deals with an evaluation of the Fargo, North Dakota, public health work for 1927. This is the second study of the Fargo health service published by the Commonwealth Fund.

EXPERIMENTAL STUDIES REPORTED IN CURRENT ISSUES OF OTHER MAGAZINES

EDUCATIONAL ADMINISTRATION AND SUPERVISION

BAIRD, JAMES, AND BATES, GUY. "The Basis of Teacher Rating." *Educational Administration and Supervision*, XV (March, 1929), 175-183.

This study is an analysis of the ratings made by 128 principals on 571 teachers in the Detroit Public Schools for the year 1926-27. The purpose was to discover first to what extent the general merit rating given to teachers by principals is correlated with success in teaching when measured by standard tests in reading in Grades I, II, and III, and secondly, to determine the interrelationship between general merit and several elements of which the Detroit Rating Scale is composed. The correlations between general merit and test scores was found to be $+.135 \pm .030$. The correlations between general merit and the other items of which the Detroit Rating Scale is composed ranged from $+.572$—$+.854$. The largeness of these latter correlations is doubtless due, in the main, to the halo effect of general merit ratings.

CLARK, HAROLD F. "Index Numbers in Educational Work." *Teachers College Record*, XXX (February, 1929), 453-460.

Index numbers are reported for cost of living for teachers, price of school buildings, the price of school bonds, and the price of instructional supplies.

NETTLES, C. H. "Teachers' Marks." *Educational Research Bulletin, Los Angeles City Schools*, VIII (February, 1929), 5-16.

A very excellent investigation based upon several thousand marks in grades nine to twelve.

WOELLNER, ROBERT, AND REAVIS, W. C. "Administrative Practices in Dealing with Personnel Problems in Secondary Schools." *The School Review*, XXXVII (March, 1929), 176-186.

This article is the sixth of a series of articles dealing with different aspects of secondary school administration.

PSYCHOLOGY OF LEARNING

CHASE, SARAH E. "Differences in the Experiences of Children." *Journal of Educational Method*, VIII (November, 1928), 62-73; VIII (December, 1928), 136-146; VIII (January, 1929), 194-198.

A series of three articles reporting an intensive study of the out-of-school activities of 209 children in grades four, five, and six.

GEORGES, J. S. "The Nature of Difficulties Encountered in Reading Mathematics." *The School Review*, XXXVII (March, 1929), 217-226.

This article reports the results of an attempt to determine the nature of the reading difficulties encountered by a first-year junior high-school class in mathematics in the University High School of the University of Chicago. The study is based upon an analysis of 188 reports for forty pupils. The article contains a summary of the kinds of difficulties most frequently experienced by high-school pupils.

HEIDBREDER, E. F. "Problem Solving in Children and Adults." *Journal of Genetic Psychology*, XXXV (December, 1928), 522-545.

Four groups of subjects were used in this investigation, namely, ten children

between the ages of two and one-half and three and one-half years of age, ten children between the ages of four and five, ten children between the ages of six and ten, and ten undergraduate adults in the University of Minnesota. The author points out in his discussion that it is a significant fact that certain situations can be counted on to produce the thought response in human beings. This fact rarely receives comment because it seems too obvious to mention, but it is none the less significant that there are certain situations which, as a rule, arouse this activity just as there are other situations which, in most cases, elicit the responses commonly classified as reflexes, emotional, instinctive, and habitual behavior. The responsiveness to problems and general ability to solve problems increase with age. The author found that there was a gradual emergence of a general form, pattern, or mode of procedure for problem solving which became more definite as age increased.

HORN, ERNEST. "The Child's Early Experience with the Letter A." *The Journal of Educational Psychology*, XX (March, 1929), 161-168.

A discussion of the unphonetic character of the English language based upon the analysis of forty-seven different sound-letter associations for the letter A, in words actually occurring in first, second, and third readers.

The author concludes that one cannot see, from the data presented that phonics should not be taught. One can only conclude that plans for teaching phonics must take into account the unphonetic character of the English language. The degree to which this obstacle may be surmounted by phonic training, what kind of phonic training is best, and how or when it should be given are questions for which at present there are no answers upon which investigations in reading agree.

MILLER, ALICE M. "Relationship of the I.Q. to Success in Learning Typewriting." *Curriculum Study and Educational Research Bulletin*, The Pittsburg Public Schools, III (January-February, 1929), 135-140.

A correlation of .33 was found between I.Q. and standard tests of typewriting, and a correlation of .26 between I.Q. and class grades. Ninety-three cases were involved in the study.

NICHOLS, M. LOUISE. "The High-School Student and Scientific Method." *The Journal of Educational Psychology*, XX (March, 1929), 196-204.

An experimental study from which the author concludes that a certain proportion of the girls entering the South Philadelphia High School acquire little in the way of mental training. Distinctly scientific method is impossible for them, although by much repetition they can no doubt acquire a certain amount of useful information and rule of thumb method which may help them to lead more efficient and helpful lives.

TROWBRIDGE, CORNELIA R. "Spelling by Rule." *Journal of Educational Psychology*, XX (March, 1929), 205-211.

An experimental study of the extent to which pupils generalize in spelling. The author says that at first the students showed utter inability to see the application of rules, and to draw analogies, but when they understood the method it aroused their interest because of its novelty, because of its sure results, because they were not dealing with the unrelated lists that make up the usual spelling les

son, and because the method was a challenge to reason quickly.

EXPERIMENTAL STUDIES OF TEACHING

FLEMMING, CECILE WHITE, AND WOODRING, MAXIE N. "Training High-School Pupils in Study Procedures with Emphasis Upon Reading." *Teachers College Record*, XXX (March, 1929), 589-610.

This article is the sixth of a series of articles on the direction of study of high-school pupils. Previous articles have dealt with problems in directing study of high-school pupils, a partial bibliography on study, a survey of investigations on study, and diagnosis as a basis for the direction of study. These articles have appeared in previous numbers of *Teachers College Record*.

GRAY, C. T. "A Comparison of the Two Types of Silent Reading as Used by Children in Different School Grades." *The Journal of Educational Psychology*, XX (March, 1929), 169-176.

A study to determine the extent to which children in grades four, five, and six are able to use two different methods of silent reading, namely, (1) reading for the purpose of answering questions when the questions are given before the reading is done, and (2) reading for the purpose of answering questions when the questions are given after the reading is done. A total of 492 children were used in the experiment. Three points are brought out, (1) children of grades four, five, and six are not able to use the two types of reading under consideration in the most effective way; (2) the regular work of the school in the various subjects increases efficiency in such work from year to year; (3) specific training would, apparently, be a distinct aid in developing the two types of reading.

GRAY, WILLIAM SCOTT. "Summary of Reading Investigations (July 1, 1927 to June 30, 1928), II." *The Elementary School Journal*, XXIX, (March, 1929), 496-509.

Part II of Gray's annual summary of reading investigations published from July 1, 1927 to June 30, 1928.

EDUCATIONAL STATISTICS AND MEASUREMENTS

DOUGLASS, HARL R., AND HUFFAKER, C. L. "Correlation Between Intelligence Quotient and Accomplishment Quotient." *The Journal of Applied Psychology*, XIII (February, 1929), 76-80.

Studies of the correlation between I.Q. and A.Q. have been negative. Wilson attempted to show that this phenomenon is a statistical necessity due to errors of measurement. This paper shows that the negative correlations obtained are not due to errors of measurement, but due to the unique nature of the correlation coefficient between a variable and a ratio of which the first variable is the denominator.

HOLZINGER, KARL J. "Accuracy in Calculation." *The Elementary School Journal*, XXIX (March, 1929), 510-517.

The author calls attention to the many inaccuracies in calculation found in current publications and suggests some simple principles of computation to overcome these. He discusses particularly the accuracy of measurements, rounded numbers, significant figures and checks.

HOLY, T. C. "A Weighting Scheme for Freshmen Grades." *Educational Research Bulletin*, VIII (February, 1929), 77-81.

The author presents a method for weighting university grades based upon the Kelley-Wood tables, Kelley statistical method, pages 371-383.

LOWE, MARY LOUISE, AND CRAWFORD, C. C. "First Impressions *vs.* Second Thought in True-False Tests." *The Journal of Educational Psychology*, XX (March, 1929), 192-195.

A study to discover whether it is better to record the first answer that comes to the mind in taking a true-false test, or whether it is better to stop to meditate or reason on the question. Two types of procedure were used, one was the actual tabulation of specific changes of answers in true-false test papers answered under ordinary circumstances, and without any thought of such an investigation on the part of the students involved. The second procedure involved experimental control of conditions through a rotated experiment. On the basis of analyses of several thousand answers, the author concludes:

(1) Detailed analysis of voluntary changes of answers in 21,903 true-false test responses showed the correct changes to be almost exactly twice as frequent as the incorrect changes.

(2) When the same changes of answers were tabulated by students it was found that a similar ratio resulted, showing that the predominance of correct changes was not due to the peculiar reactions of a few individuals.

(3) When these changes of answers were tabulated by test questions it was found that the predominance of correct changes was not due to the peculiar nature of a few questions.

(4) When students were asked to record their first impressions and later to record their second thoughts, it was found that the second thought scores were significantly higher.

(5) There was no significant advantage shown in having each student read the questions over before answering them, since the "delayed answer" scores were almost exactly equal to the "first impression" scores.

(6) Second thought is not different from first impression on nine out of ten questions, but the one case out of each ten is enough to make a significant improvement in scores.

STURTEVANT, SARAH M., AND STRANG, RUTH. "Activities of High-School Girls." *Teachers College Record*, XXX (March, 1929), 562-571.

A study of the daily schedules of 152 high-school girls. Data is presented for the time spent on class attendance, study, physical activities, social activities, religious activities, remuneration work, cultural activities, sleep, dressing, and meals. These girls spend on the average of nine and one-half hours in sleep, one hour in voluntary physical activity, one and one-half hours in eating, two and one-half hours in study, one-half hour in extra-class activities, one and one-half hours in social activities, one-half hour in "fooling around," an hour in home duties, and an hour in recreational activity.

NEWS and COMMUNICATIONS

Address all research news and communications to Editor Earl Hudelson, College of Education, University of Minnesota, Minneapolis, Minnesota.

What he called "simply another drop in the bucket" is a report from Supervising Principal Elmer E. Sipe of Burnham, Pennsylvania, to his teachers, entitled "School Marks." It shows graphically that the proverbially chaotic conditions of marking apply to some extent in the Burnham schools. The communication ends with constructive advice on ways of improving conditions.

A laboratory on the individualization of instruction will be conducted for superintendents, principals, supervisors, and teachers during the coming summer at Winnetka, Illinois. The work will be under the direction of Superintendent Carleton Washburne.

The National Probation Association, 370 Seventh Avenue, New York City, has had a committee of eminent judges draft a revised standard juvenile court law which has been submitted to state legislatures for their guidance in effecting improved legislation for the control and welfare of juvenile problem cases. Adoption of the proposed revision would enable courts to dispense with certain technicalities and to "deal with persons and situations, not with separate acts."

The possibility of the school as an agency for the prevention of delinquency will be discussed before the National Conference on Social Work at its fifty-sixth annual meeting in San Francisco, June twenty-sixth to July third.

A study of 559 freshmen at Colorado State Teachers College on the relation of intelligence and achievement test scores to mortality and scholastic ratings has been conducted by Philip M. Condit, Research Assistant. In brief, the findings are as follows: twenty-three percent of the group failed to complete one year's work. Of those who failed, forty percent were in the lowest fifth in intelligence, sixty-eight percent in the lower half, and nine percent in the highest fifth. The heaviest loss was during the winter quarter. Complete data on the lists for mortality were unavailable for fifty percent of the cases. Sixteen percent fell in the same decile in scholastic rating and intelligence scores. Thirty-eight percent exceeded expectations and forty-six percent fell below. One-fourth of those who failed to complete their work failed because of poor scholarship.

A comparison of the relative effectiveness of instruction for Minnesota farm and urban boys is being made by Harry S. Genung, instructor in social sciences at the Eveleth, Minnesota, Junior College. Mr. Genung is administering intelligence and achievement tests to the students of the four state agricultural schools for the purpose of discovering whether or not these students achieve as much by studying academic subjects, together with practical training in agricultural subjects, for six months of the year as regular high-school students

achieve in nine months of study in academic subjects alone.

The educational world today needs additional endowments for special purposes and not necessarily of large capitalization, according to the annual report of Frederick P. Keppel, President of Carnegie Corporation of New York. In these days of rapidly changing social and economic conditions, the time is most propitious for studies of rural life, in recreation, the home and family, in the church as a social agency, and in town and regional planning. What we have learned from modern psychology could profitably be applied in pre-school training and in all departments of education to a concentration of attention upon the individual instead of the curriculum. Perhaps the greatest single contribution which could be made to human progress would be the discovery of means for the early recognition of what we call genius. Schools of agriculture and commerce would greatly profit by the same consideration which our schools of medicine have received, and physics needs the same attention that French and mathematics have had. The desirability of greater encouragement for research in the humanities has already become evident to educators. The vocational school lying below the collegiate or professional level is a type of institution of great potential usefulness but thus far relatively neglected. Nursing and dental education, for example, should be added, as should the educational opportunities of the moving picture and the radio. These are all typical fields in which interesting proposals are constantly being made, and in which the need is obviously not for scattered experiment but for such a coördinated program extending over a term of years as no existing foundation with its present obligations can undertake.

Research, survey and demonstration represent activities with which an educational foundation today must to a very large degree concern itself, according to President Keppel. In a real survey there are two steps necessarily involved: The first requirement is an analysis as complete as possible of the facts in the individual situation studied; the second is the development of a program of advancement which provides a basis for progress toward a recognized goal. Thus the survey method is that process through which, enterprises are provided with related facts which are then made the basis for intelligent action. It is a connecting link between research and action. A recent list compiled by the Russell Sage Foundation records more than 2,700 surveys in the United States, of which 311 have primarily to do with education. During the past summer, a study was conducted under the auspices of the Corporation, including some 200 surveys of cities, large and small; some 40 of counties and states; more than 25 of higher institutions, either singly or in groups; and more than 15 dealing with subject matter. Many of these enterprises must be condemned as wasteful of money and, more important, of human energy. If a movement of this size is to be judged fairly, however, it must be judged as a whole, and the results of the study make it abundantly clear that the survey is not an educational fad. It is a necessary factor in the scientific management of large enterprises. It is widely used in attacking the problems that challenge not only education but industry, health, religion and politics. Significant changes in city and state educational organizations, in higher institutions, in professional education, and in

the curriculum have already resulted from survey recommendations. This widespread survey activity has touched education from hundreds of angles; it has played an important part in the extension of the scientific movement in education.

It should be borne in mind that educational surveys divide themselves roughly into two groups: those dealing with an organized field of activity under some form of authority, as, for instance, a city or state school system; and those in which, though an equally large number of people are directly concerned, there is no such centralized authority. In the first type, the community can very properly be expected to meet the cost of the study. For a study of the second type, however, those interested must turn to some outside agency, such as an educational foundation.

New knowledge may be gained by research or by the fact-finding advances involved in the survey, but before it becomes of general usefulness, a demonstration must be made. This process, however, is usually left to time and chance. Sometimes an opportunity occurs to expedite this casual and wasteful process. Mr. Carnegie's gifts to town libraries were not so much in the direct interest of the communities he helped as a superb demonstration that all communities should have adequate library buildings and can afford to maintain them.

Individual Differences in the Reading Ability of College Students[1]

Statement of Problem

To study individual differences in the reading ability of college students with the view of deriving suggestions for the improvement of college teaching through greater individualization of instruction.

Method of Procedure

An intensive study was made of the individual differences in the reading ability of 237 University of Missouri students. The research technique employed was primarily that of test and measurement accompanied by the necessary statistical procedures. Intelligence tests, vocabulary tests, standardized reading tests, and specially constructed reading tests based on material from educational psychology were given.

The investigation centered around the study of (1) central tendencies and distributions as determined by the scores on the various tests, (2) relationships as shown by correlations based on ability to read different types of material, and (3) reading ability as influenced by sex, age, social status, year in college, school or college enrollment, where the student first learned to read, early instruction in silent reading, and manner of spending leisure time as a child.

Summary of Findings

Extreme individual differences exist in the reading ability of college students. These differences are great enough to demand individualization of instruction on the basis of reading ability. In a given time, the best reader in a group can do from four to six times as much as the poorest reader, while the average performance of the members of the highest fourth of the group is two and one-half times that of the lowest fourth. In other words, a two-hour reading assignment for the average member of the highest fourth is a five-hour assignment for the average member of the lowest fourth.

The best readers in a course in educational psychology are taxed to about fifty percent capacity for the most part, while the poorest readers are not only

[1] Anderson, Ernest M. *Individual Differences in the Reading Ability of College Students.* Doctor's Dissertation, University of Missouri, 1928.

working to full capacity, but are comprehending only about twenty to thirty percent of the more difficult material and from fifty to sixty percent of the easier material.

Intelligence has a close relationship to college reading ability and is a limiting factor in reading complex technical material.

The correlations between the abilities to do different types of reading are fairly high, usually from .5 to .6, but they are low enough to show that reading as demanded in college is not a general ability acquired once and for all time, but that it is a fairly specific process depending on the type of material and the purpose of the reader.

The reading ability of college students is influenced slightly by sex, age, social status, etc. However, no one of these factors operating singly is of sufficient importance to necessitate differentiation of instruction on the basis of that factor alone. Since these different factors may be combined in various ways, either counteracting or reënforcing each other, reading ability is a matter to be treated individually.

Diagnostic reading tests, remedial instruction in reading, and adapting reading assignments to individual differences are suggested as a partial solution to the problem.

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WHAT IS A CORE VOCABULARY?

In the January, 1929, number of *The Journal of Educational Research* there appears a list of words under the title "A Core Vocabulary for Elementary School Pupils."[1] The method used in securing this vocabulary is described thus:

"The association method was used in this study. Four hundred stimulus words were chosen, representing all phases of the experience and environment of the elementary child. These words were arranged in eight lists of fifty words each.

"The eight lists were submitted to fifty students in each of the grades IV to VIII inclusive, who were selected from eleven elementary schools in California and Oregon. The tests were given so that no one group of students responded to more than one list of stimulus words. After each stimulus word, space was left for the student to write in four or five words which he associated most closely with the stimulus word."

Four thousand five hundred fifteen different words were found, 1309 of which were common to all grades (Grades IV to VIII). These 1309 words are submitted by the authors as a core vocabulary for elementary school pupils.

Not only the method but the results of this experiment show that such a list cannot appropriately be named a "core vocabulary," either for children in general or even for the children who participated in the test. The small number of pupils participating, and the relatively small number of running words which were analyzed lead one to doubt the reliability of the list as a "core vocabulary" for elementary school children in general, but these defects are not so serious as those inherent in the method which was used. If an association test is to give an adequate measure of the vocabulary of children at a given level, it must be elaborately and carefully planned. Obviously much depends on what particular four hundred words are chosen and how associations are stimulated. But no matter what list of stimulus words is selected, the association method as used in this experiment is un-

[1] Shambaugh, C. G., and Shambaugh, Olive L. "A Core Vocabulary for Elementary School Pupils." *Journal of Educational Research*, Vol. XIX, pp. 39-46.

likely to secure a reliable picture of the vocabulary of children at the given levels, for in this method certain types of words (pronouns, connectives, etc.) are likely either not to appear at all or to appear much less frequently than in the child's actual working vocabulary. Perhaps the best way to illustrate the shortcomings of the association method as applied by the authors is to examine the list of 1309 words which they give as common to all grades and as constituting a "core vocabulary" for the elementary school. I have checked this list against various vocabulary studies including the following: Thorndike's *The Teacher's Word Book*, Horn's *A Basic Writing Vocabulary*, Mrs. Ernest Horn's three investigations of the vocabulary of children of kindergarten age, and the best-known investigations of the vocabulary of children's themes.

Let us now make the assumption that any word used with great frequency by children of five, used with great frequency year after year throughout the elementary school, and falling among the thousand commonest words both in Thorndike's *A Teacher's Word Book* and in Horn's *A Basic Writing Vocabulary* ought to appear in any core vocabulary selected for the elementary school. A large number of words which meet all of the standards given above do not appear in the "core vocabulary." Among these words are the following, which are taken from words beginning with the letter "a." The words preceded by a star are either among the first one hundred words of the Thorndike list, or among the first one hundred words of the Horn list.

*about	already	another
*again	always	*any
*all	*am	*are
almost	*an	*as
alone	*and	ask
along		*at

Notice, for example, the word *all*. *All* is in the first hundred of the Thorndike list, it is in the first hundred of the words most frequently used by adults in writing, it was found 3826 times in Mrs. Horn's investigation of the vocabulary of children of kindergarten age. It is reported in every extensive investigation of the writing done by children in school. Neither *all* nor any other words of the above list can be left out of a "core vocabulary" for the elementary school. There are hundreds of words used with high frequency by children in every grade from I to VIII and by adults, but which do not appear in this "core vocabulary." It contains no personal pronouns and only four of the fifty words which are used most frequently in writing.

On the other hand, many words appear in the "core vocabulary" which, according to the best evidence we have, belong in the marginal vocabulary. For example, *agate* does not appear either in the Thorndike list or in Horn's Basic Writing Vocabulary. It is used occasionally by kindergarten children, but it is a low frequency word. It does not occur in any of the best-known studies of the writing done by children in school. In other words, it is not only a marginal word in the vocabulary of young children but a very low marginal word at that. It is therefore impossible to regard it as a "core" word.

This does not mean that there is no place for the association method of studying vocabularies. On the contrary this technic will have an important place in the vocabulary research of the future. But the method must be very carefully planned in the light of known facts about vocabularies and vocabulary research if it is to yield reliable or useful results.

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Attitude as a Factor of Scholastic Success in College[1]

The purpose of this investigation was to ascertain: (1) The significance of attitudes as factors of scholastic success in college; (2) What attitudes are conducive to success; (3) What ones are inimical to success; (4) Their relation to other factors of scholastic success. After careful examination of previous studies, the investigator selected the following factors for investigation: (1) general intelligence, (2) previous subject-matter preparation, (3) reading ability, (4) study habits, (5) attitudes. Of the last mentioned, five were selected for study: (1) ambitious-indifferent, (2) cheerful-despondent, (3) evaluative-non-evaluative, (4) persevering-vacillating, (5) self-confident-dependent. Various measuring instruments for these several factors were either adopted or developed by the investigator. Two groups of students were involved, 260 students of elementary educational psychology, and 113 students of the technique of teaching in high school.

Although the study had certain decided limitations, yet the methods of obtaining them were safeguarded in such ways as to give one enough confidence in the validity and reliability of the data to believe that conclusions based upon them are worthy of careful consideration and tentative acceptance. Furthermore, the data possess certain characteristics, such as consistency, which confirm this belief. On the other hand, the objects of this study are by no means removed from the field of controversy. We must still forego the pleasures of statistical certainty in this as well as in many other fields.

The investigator concluded that the major factors of scholastic success are: (1) previous preparation, (2) general intelligence, (3) study habits, (4) evaluative-non-evaluative attitude, (5) persevering-vacillating attitude, (6) self-confident-dependent attitude. The first five are related to success in a positive way; that is, a high score or rating on any of them is indicative of success. Although the evidence is less convincing for the self-confident-dependent attitude than for the other five factors, it appears that this attitude is related to success in a negative way.

The author further concludes that it is doubtful whether another investigation along the same or similar lines would be profitable at the present time, even if all possible refinements in technique were effected. When traits of character and other "non-intellectual" factors have been more satisfactorily differentiated and described than at present, adequate measuring instruments developed, and valid statistical techniques devised, such an investigation should be earnestly undertaken. At present, the most urgent need is to fill these vital gaps in the foundation of our science of education.

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The Creative versus The Traditional Methods of Teaching Electricity

This study was made to determine the relative effectiveness of two methods of teaching electricity, namely, the Traditional, (or the assignment, laboratory, recitation plan) and the Creative Method, (a modified form of the differentiated assignment). In the latter method no definite time was set aside for laboratory work, but the students were permitted to work with the apparatus whenever they desired.

[1] Herriott, M. E. *Attitudes as Factors of College Success.* Doctor's Dissertation, University of Illinois, 1929.

Groups of equal ability were established upon the basis of scores made on the Terman Group Test of Mental Ability, on the Stanford Achievement Test, and grades made in science classes.

The experiment lasted for a period of twelve weeks. The Iowa Physics Test on Electricity were given both as pre-tests and final tests. All conclusions were based upon the results shown in these tests. The element most closely observed was that of the improvement made.

The following table is given to show the results as they appeared on one form of the Iowa Tests.

A. *Traditional Group*

Student Number	Pre Test Form 1	Final Test Form 2	Improvement
6	17.1	76.9	59.8
3	23.4	76.9	53.5
14	23.4	68.8	45.4
26	9.3	68.1	58.8
2	15.6	66.9	51.3
11	23.4	65.5	42.1
19	12.0	58.1	46.1
7	15.6	53.5	37.9
22	23.4	48.3	24.9
10	23.4	38.3	14.9
18	33.6	37.4	3.8
15	17.7	31.6	13.9
23	9.9	26.9	17.0
27	17.7	25.4	7.7
30	11.4	21.6	10.2
32	23.4	17.5	5.9

	Pre Test	Final Test	Improvement
Arithmetic Mean	18.76	48.56	30.84
Standard Deviation	6.33	19.92	19.77
P. E. Average	1.06	3.35	3.33

B. *Creative Group*

Student Number	Pre Test Form 1	Final Test Form 2	Improvement
12	9.9	77.8	67.9
13	28.8	65.5	36.7
21	15.6	65.5	49.9
8	15.6	60.2	44.6
5	25.0	59.7	34.7
16	17.7	58.7	41.0
20	23.4	58.7	35.3
28	15.6	57.6	42.0
4	23.4	57.1	33.7
1	9.9	56.1	46.2
9	17.7	53.5	35.8
17	17.7	52.9	35.2
25	15.6	43.0	27.4
24	15.6	43.0	22.3
31	9.9	28.0	18.1
29	17.7	26.9	9.2

	Pre Test	Final Test	Improvement
Arithmetic Mean	17.57	53.8	42.5
Standard Deviation	5.25	12.50	12.98
P. E. Average	.88	2.11	2.18

A comparison of the two groups

	Pre Test	Final Test	Improvement
Obtained Difference	1.19	5.3	11.7
Probable Error Difference	1.38	3.96	3.98
Critical Ratio	.9	1.34	2.93

If a close analysis is made of the material furnished in the preceding table it will be noticed that there was almost no difference whatever in the knowledge of electricity which the two groups showed at the beginning of the experiment. It appeared, however, that the group using the Creative Method made the greater improvement. A critical ratio of 2.93, however, is not sufficiently large to be considered statistically significant.

CHESTER A. DODGE

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THE MEASUREMENT OF GENERAL ATHLETIC ABILITY IN COLLEGE MEN[1]

It was the concern of this study to set up a battery of tests which can be used to classify college men according to their big-muscle efficiency and to diagnose their weaknesses. The following guiding principles were used in the selection of such a battery: (1) Administrative simplicity; (2) Reliability and objectivity of individual tests; (3) The including of all elements of general athletic ability in the final battery; (4) A high correlation of the final battery with a reliable criterion; (5) Weighting of the sub-tests to give the highest possible correlation with the criterion.

The composite judgment of fifty-six representative physical educators was used to formulate the general skills and strengths or elements which contribute to general athletic ability. Forty-one tests were grouped under the seven elements of general athletic ability and records secured from two hundred thirteen men. These records were reduced to

[1] Abstract of a doctorate dissertation presented by Frederick W. Cozens to the Graduate School, University of Oregon, July, 1928.

comparable measures in each test by means of McCall's T-Scale. A composite score for each man was computed by adding the averaged scores under each of the seven elements. This composite score was then used as an objective figure for comparison with various criteria for establishing validity.

Four facts point to the validity of the composite score as a measure of general athletic ability: (1) it is made up of the separate elements of general athletic ability as set up by competent judges in the field of physical education; (2) two previous studies[3] in the field of physical tests have used a composite score on a short battery of athletic ability tests as one of the criteria for establishing the validity of tests; (3) a high coefficient of correlation (.936) exists between the judgment of University instructors as to ability and the composite score; (4) athletes secure such a high composite score that only three men out of one hundred in an unselected college group ever attain the mean score of the athletes.

Kelley's method of successive approximations was taken as a means of determining optimum weights for a battery of tests which would have the highest multiple correlation with the criterion. The battery found to correlate highest with the criterion score consists of the following events with their T-Score multipliers or weights: Dip (.6); Baseball Throw for Distance (1.5); Football Punt for Distance (1.0); Standing Broad Jump (1.0); Quarter-mile Run (1.2); Long Dive (.7); Dodging (1.0). This battery yielded a multiple correlation coefficient of .9708 with the criterion and a standard error of estimate of true ability of only twenty-one percent of the standard deviation of the criterion score distribution. The battery reliability coefficient is .968.

Because of the fact that the battery of tests measures fundamental big-muscle strengths and skills, it serves as an index for classifying students physically as superior, above average, average, below average, and inferior, and is very helpful to the instructor in grouping his students for teaching purposes. A review of the T-Scores made in each test immediately gives the examiner a picture of the physical weaknesses of the student so that the battery serves as an index for the prescription of physical activity. The battery may therefore be used for diagnosis as well as classification.

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[3] Rogers, F. R. *Physical Capacity Tests in the Administration of Physical Education.* Also Brace, D. K. *Measuring Motor Ability.*

RELATION OF EFFICIENCY TO EXPERIENCE AND AGE AMONG ELEMENTARY TEACHERS

An investigation was made to determine the relation of teacher efficiency to teacher experience and teacher age among elementary teachers. It was the aim of the investigation to answer the following questions: Does teaching experience result in greater teaching efficiency? If so, how much? Does the age of a teacher affect teacher efficiency positively or negatively and, if so, to what degree? This paper gives the results of the investigation.[1]

The validity of the results of the study depends upon three factors, namely, the validity of the criterion for teacher efficiency which was used, the procedure utilized in securing the data, and the method of handling the data.

[1] The study described here is part of an extensive investigation which was made to determine the various factors of teacher ability. Funds for the extensive investigation were furnished by the Bureau of Public Personnel Administration, Washington, D. C. The schools and superintendents coöperating in the study are duly acknowledged in a report published in the official organ of the Bureau of Public Personnel Administration.

THE CRITERION

The criterion used in determining teacher efficiency was the Professional Tests for Elementary Teachers' Aptitude, devised by F. B. Knight, G. M. Ruch, Fred Telford, and J. E. Bathurst. An extensive study had been previously made to determine the predictability or validity of these tests relative to elementary teachers. The study showed that the tests predicted teacher efficiency among elementary teachers when based upon the judgments of superintendents and supervisors who had actually observed the teaching efficiency of each teacher judged for at least one school year to a much higher degree than the prediction of the weighting of such factors as grades in high school, grades in college courses other than professional, grades in professional courses, efficiency in practice teaching, abstract intelligence, and physique, as shown by Whitney's study.[2] According to this study, the multiple correlation of the above factors with teacher efficiency was .288. 'Teacher efficiency' was determined by judgments of school officials. The correlation of the tests used in this study with teacher efficiency as judged by superintendents and supervisors, as described above, is .5. This coefficient of correlation is quite significant when compared with the coefficient found by Whitney between the measurable products of educational institutions and teacher efficiency and when the low standard deviations of the rankings of the teachers and of the scores on the tests are considered. The reliability of the tests used in this study is .8.

Test No.	Test Name	No. of Items
1	Professional Judgment	28
2	Theory and Practice of Teaching	85
3	Reading Comprehension	25
4	Social Information	24
5	School and Class Management	55
6	Professional Information	33

[2] Whitney, F. L. "Predicting of Teaching Success." *Journal of Educational Research*, VII (May, 1923), 420-428.

PROCEDURE

The Professional Tests for Elementary Teachers were given to teachers of fifteen school systems which were located in ten states. The schools or school selected in each state were considered typical of the schools in that state. Both large and small school systems were represented in this study. The tests were given to from 30 to 40 teachers in each school system. This group was considered a sampling of the teachers in that school system. Since the tests used had been previously standardized, the standard method of administering the tests was used in all school systems.

The following table gives in brief the nature of the tests used. As standardized, the six tests compose one test leaflet.

Type of Items	How Score is Determined
Multiple Response	Rights
True-false	Rights minus wrongs
Varied Response	Rights
Multiple Response	Rights
True-false	Rights minus wrongs
True-false	Rights minus wrongs

Due to the failure on the part of some of the teachers either to give their age or the number of years of teaching experience, some of the test leaflets had to be discarded. After this sifting process three hundred test leaflets remained. The standard method of scoring the tests was used.

EXPERIMENTAL RESULTS

The following table shows the total range (R), mean (M), number of cases (N), and standard deviation (S.D.) of the distributions of age in years, experience in years, and scores on the tests, of the teachers.

	R	M	N	S.D.
Age	46	37.3	300	8.70
Exp.	43	17.2	300	7.74
Scores	154	122.2	300	27.50

It will be observed that the total range, the mean, and the number of cases are sufficiently large to give significance to

the results obtained. The size of the standard deviations is also significant in that they are sufficiently large to result in a high correlation if relationship exists between the distributions.

The following table gives the various zero order correlation coefficients, the probable error of each coefficient of correlation, and the various partial correlation coefficients.

	Exp.	P. E_r	Age
Score	.06	± .039	−.03
Exp.			.869

It will be observed that the coefficient of correlation between experience and score is less than twice its probable error. A coefficient of correlation must be three times its probable error and ought to be five times its probable error to be significant. This coefficient therefore means that the teaching experience of a teacher after the first year has no relationship to the efficiency of a teacher. The coefficient of correlation between age and score is —.03. This is not significant since this coefficient is less than its probable error. This means that the age of a teacher has no relationship to the efficiency of a teacher. A high positive correlation between age and experience is, of course, to be expected. It is .869.

The casual relationship with which we are most concerned may be determined by the technique of partial correlation. It will be observed that when the factor of experience is held constant the correlation between age and score is —.171. This coefficient is 4.5 times its probable error. This correlation is thus of very little significance. It may point to the possibility that the older a teacher is the less efficient she or he is. When score is kept constant the correlation between age and experience remains high, which is to be expected, for a certain minimum age limit is always required for certification. The correlation between score and experience when the factor of age is kept constant is seen to be slightly higher than the zero order correlation. It is .178. This coefficient is slightly more than 4.5 times its probable error. It is therefore of very little significance. In other words, the relation between teacher experience and teacher efficiency is slight.

P. E_r	Exp. out	Score out	Age out
± .039	−.171	.888	.178
± .011			

By way of summary, this study shows that teacher efficiency decreases slightly with age and increases slightly with experience. The decrease due to age and the increase due to experience are so slight as to be practically negligible. The study would suggest that we must look for factors other than age and teaching experience if we would find those which constitute teacher efficiency.

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